

# THE MINING AND METALLURGICAL JOURNAL.

FORMERLY THE PACIFIC COAST BULLION.

Vol. XVI., No. 1

LOS ANGELES, CAL., OCTOBER 1, 1896

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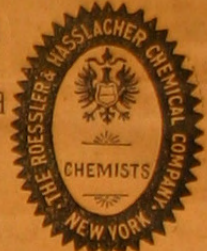
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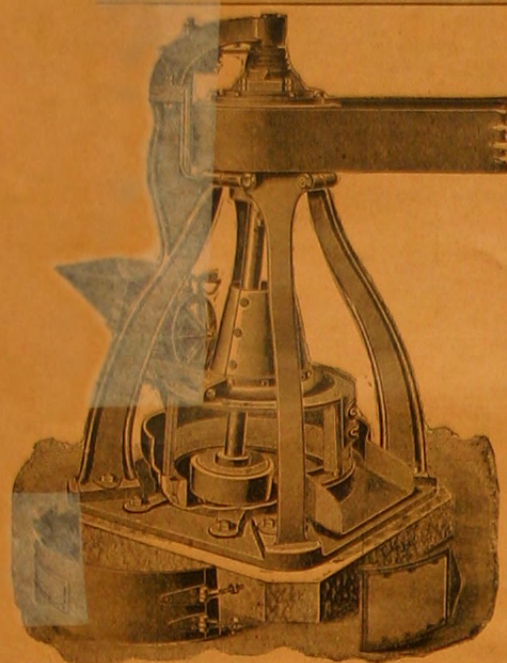
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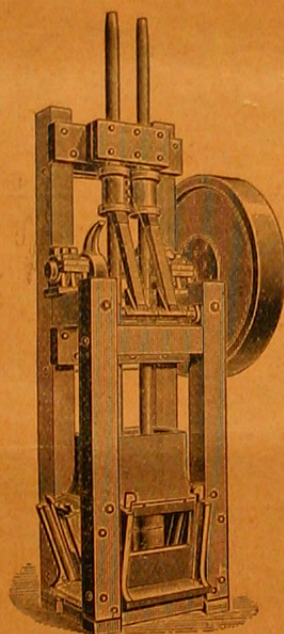
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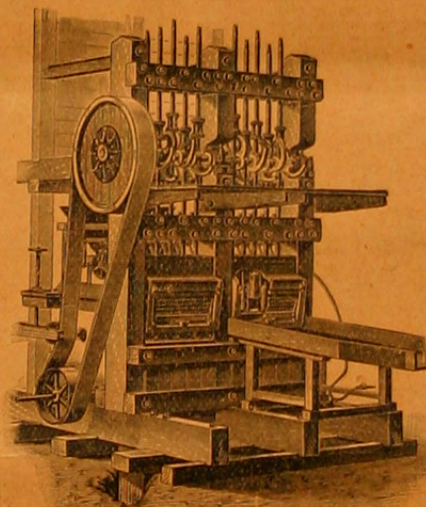


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*F. W. EDELSTEN, Editor.*

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## THE RECENT ELECTIONS

There is unrest in the country, and a tremendous weakening of party lines. Different remedies are proposed for the existing ills.—that of the Bryanites has not been tried, and as the others have been, it is not improbable that the people may reason that it is best to try a new remedy, for a worse condition cannot be produced. The successes, so far, of the republicans have been in capitalistic states, and those on the Democratic side have been in the producing states.

The pending campaign is a contest between the capital section on one side and the producing sections on the other. There are more electoral votes in the latter than in the former. The capitalists, as is their wont, will fight the next battle. Capital is said to be timid, but capitalists are not when their interests are at stake. Producers are more yielding and generous, and money changers more sordid. "Bad men," says Macaulay, "will assail with far more vigor and persistency than good men will defend good prin-

ciples." The moneyed man will go farther in defense of the interest he possesses than the men who have interests to acquire. This principle renders doubtful the result in November.

WEALTH IS KING

This is reported to have been said by Mr. Estee, in a recent speech delivered in San Francisco. He is correct. All kings are sustained on their thrones by wealth. It is the very basis of monarchy and aristocracy. They exist because they can command wealth. Mr. Estee might truthfully have added that, when concentrated in the hands of the few, wealth is a tyrant.

For the last thirty years, our financial policy and business methods have been such as to lead to such concentration, and to-day the country is suffering from the exactions and tyranny of the money power. Steps taken to fasten goldism upon the country have shackled and manacled the masses, and unless the policy and business methods in vogue are displaced by those that prevent concentration of wealth, the country will pass under the absolute domination of a plutocratic oligarchy. The condition is little short of that now. Goldism was invented for the few and not for the masses. Whether the narrow basis which it imposes is to be endured depends upon the intelligence, virtue and courage of the people. The plutocrats resist free silver coinage, because, if adopted as a financial policy, wealth cannot be so easily concentrated. Wealth fairly distributed cannot be a tyrant, for there will be independence and the power to successfully resist on the part of the many. Poverty, long existent, emasculates manliness and self-respect, and what plutocrats want is that it shall be sufficiently prevalent to guarantee against resistance to their extortions and tyranny, hence they oppose enlargement of the money volume.

## STILL THREATENING

M. H. De Young of the San Francisco *Chronicle*, has just returned from Europe, and in an interview he gives the country a repetition of the old threat, that if we adopt bimetallism, Europeans will withdraw their investments from this country. The goldites evidently believe the American people to be cowards, too dependent to be otherwise than poltroons when menaced by European capitalists. Europeans withdraw their investments! Where will they go for a better field? There can be but a small opening in Europe or there would not be so much idle money. The accumulations of Europeans are from distant countries, American, African, and Asiatic, and in no country have their gains been so great as in the United States. They prefer to invest here than elsewhere, because we have an enlightened and stable government. No force has to be employed, as in nearly all countries where Europeans invest. Of course the capitalists across the Atlantic prefer that we should have the gold standard, as it assures larger gains than if we had the double standard.

Should foreigners withdraw their investments what would be the consequences? At first it would cramp us a little, but it would be the cause of our adoption of a policy which would redound to our future prosperity. It would be illustrative of that passage of Scriptures which says "Our light afflictions which are but for a moment work out for us a far more exceeding and eternal weight of

glory." It would emancipate us from the thralldom of the European money power. The worst policy ever pursued in the nation is that of seeking and relying upon European money to carry on our enterprises. Had we resolved to build no faster than we had the means to do with, we probably would not have so many railroads nor as much development in other respects, but we would have had some money of our own, and little or no foreign indebtedness. The consequences of that policy are that we have a deficient money volume, and are pressed and distressed to pay interest on foreign loans and dividends on capital invested in our industries. The sooner we make a change and rely upon ourselves, and increase our money resources the better it will be for us, until we do so we will not be independent, nor be otherwise than an actual second-rate power, though in population, intelligence, and natural resources we stand in the very front rank. It is demoralizing and debasing to the American character to be buffeted, bamboozled and menaced by foreign capitalists. Are there not enough virtue and stamina on the part of our people to assert their independence, and to get out from under the unrelenting tyranny of the trans Atlantic money power? If not, we must suffer in our handcuffs and manacles.

## LOS ANGELES OIL DISTRICT

During the last three months, this oil field, located in the northwest part of the city, in the midst of a residence section, has been extended towards the northeast, making the limits of the field, so far as developed at present, twice the length it was a short time ago. This has been occasioned by the drilling done, under the direction of Mr. William Duncan, on the land of General Broughton, between Yates and Adobe streets, and north of College street, under a lease to Maier & Zobelein, brewers of this city. On the northwest corner of the land, near the corner of College and Adobe Streets, a well about 900 feet deep has been sunk, and for some weeks has produced an oil of 18 degrees gravity, being superior in quality to any so far found in this field. A second well has been drilled to a depth of 400 feet, when oil-bearing shale was penetrated. This well is near the corner of Pearl and New Depot Streets, and about half way between the old part of the oil field and the well on Adobe and College Streets. As a result of this, more oil derricks are being built in the new section, on the line of strike from the new well to the older portion of the field on the west, along New Depot street. This extent marks a new era in the field and promises well for its future development and commercial importance to the city and district.

## DENVER MEETING OF A. I. M. E.

The fall meeting of the American Institute of Mining Engineers was held in Denver, Col., from the 21st to the 26th ult. The eastern members from the well-protected iron mining and manufacturing states, with the representatives of enterprises in gold on Wall Street, have had an opportunity to make note of the want of protection granted to the silver interests of the west. If a visit to Colorado, and the sight of closed and abandoned mines and smelters cannot convince the protectionist, who does not want any protection except to his own industry, that our silver interests require protection from the free trade by England in our silver product, there will be indeed little use to try to make object lessons act as a gold cure.



## THE LABOR WAR IN COLORADO.

For over three months, the dispute as to the rate of wages between the mine owners and their employees, through the controlling influence of the Miners' Union, in Leadville, Colorado, has continued. With no concession being agreed to on either side, the blockade was the inevitable result. On resuming operations with non-union help, some of the owners disregarded the threats of the miners. No wiser councils prevailing on either side, this has resulted in open war and the loss of some valuable property and several lives. As a result of this, the district is under martial law and the militia under arms. The ore supplies for the smelters come from the closed mines, and the surplus ore on hand will soon be exhausted, and more idleness and misery will fall to the lot of those who are not in the strike and desire to work. This account is but a reprint of the history of strikes where the negotiations are conducted by agitators and not by the miners themselves.

In small mines and works, where labor is not organized, strikes are of rare occurrence, for the employees and management or owner are personally known to each other, and they have a personal regard for each other, or a feeling of interest in each other's welfare. In large mines and works, the opposite is too often the case, and the owner is little or not known to the men, and the mediums of communication between them are managers and foreman, whose object often is to get the most out of the employees for the least amount of money and most credit to themselves, in the majority of cases. In the last case, the employee becomes a mere part of the plant and machinery of the mine or work, and where this class of labor, under the conditions mentioned, becomes organized into a labor union, unless the wisest councils prevail, the interests of labor so organized and those of united capital in the same industry become under these conditions, in the most favorable manner, opposed to each other. It must, however, be kept in mind that the union of capital was the first to combine against the interest of labor. Labor was therefore forced to combine in self protection. When any body of men unite to guide or control their own actions, they are doing what is right, but when they try to control the actions or liberties of those who do not belong to their own society or organization, they are taking to themselves or assuming powers which alone belong to the officers of the law, and are consequently doing an illegal act. Herein it is that the trouble comes, when the suffering interests of labor are placed in the hands of agitators or third parties, and wisdom and kindness do not find sympathetic consideration in mutual adjustment on both sides, and a policy of conciliation is disregarded.

The evil effects of this strike on the interests of mining in Colorado, both in Leadville district and in other camps, will be to retard the adjustment of capital in these sections. The history of strikes in Idaho and elsewhere is only being repeated in Colorado.

## THE TRANSMUTATION OF SILVER INTO GOLD.

"The next step was to ascertain whether the substance could be so treated as to be grouped into molecules of greater density than those of silver. Here the element of personal danger was introduced into our researches, and the success of our work on a commercial scale has yet to be assured by the construction and safe manipulation of new

apparatus, in which vast energy will be employed.

Working upon the necessarily microscopical scale of our experimental researches, we found that the substance called by us argentaurum can be aggregated into molecules having a density considerably superior to that of silver molecules, and, we think, identical with that of ordinary gold molecules. Whether we are right as to this or not, the condensed argentaurum presents the appearance and is endowed with the properties of ordinary metallic gold.

For example, it is green by transmitted light, and yellow by reflected light; properties which, as all chemists know, are possessed by gold alone. Its resistance to the action of either nitric or hydrochloric acid alone, and its solution by a mixture of these acids, are also distinguishing properties of pure gold and of no other yellow metal.

Under the microscope it is undistinguishable from ordinary gold. We feel assured, therefore, that when produced in bulk, it will comply with all the tests of the United States Mint, and will be accepted by the commercial and financial world as being in very fact true gold.

It may be thought that all this work of ours is merely a resuscitation of ancient alchemy, and that we are engaged in what for ages has been considered the hopeless quest of the philosopher's stone. This, however, is by no means the case.

The ancient alchemists believed that some substance might be found by the mere touch of which base metals could be transmuted into silver and gold. Others, less crude in their ideas, believed that gold and silver were in reality base metals with the addition of some "informing spirit," and this spirit they held could be added if a suitable "powder of projection" should be thrown into the molten iron or lead or other base metal employed.

Modern chemistry regards the matter from a very different point of view. It believes that the ultimate particles constituting gold, silver, iron, lead, zinc and all other metals are identical in substance, and that the different properties of the different metals depend entirely upon the different ways in which the particles of the common substance are arranged.

The periodic law of the elements is the formal expression of this doctrine. It is called periodic because chemists have found that when all the known elements are arranged in the order of the respective weights of their molecules, each displays a remarkable similarity of properties when compared with the element separated by an interval of seven places in the table.

For example, the first element, sodium, in series 3, is succeeded by seven other elements which differ more and more from it in physical properties. But when we come to the ninth, namely, potassium, we suddenly find ourselves in the presence of a substance very similar in many physical and chemical respects to sodium.

This recurrence of properties at given numerical intervals in the table, or this periodicity, as it is termed, goes to show that mere weight—or, rather density of aggregation—is the determining cause of the properties that distinguish the various elements. This is no mere theory.

If a new element were to be discovered tomorrow, and any chemist were to be told its atomic weight, he, by merely noticing the position such weight would cause the element to occupy in the numerical table I have men-

tioned, would be able to describe, with considerable accuracy, the appearance and physical and chemical properties of the substance without having seen or examined it. Prof. Mendeljeef, the chief discoverer of the periodic law, found a certain gap in the numbers constituting the table.

He thereupon asserted that an element must exist having such and such properties. Some little time afterward this very element was discovered, and was found to have the atomic weight and properties which Mendeljeef had predicted.

Similar reasoning may be employed to demonstrate the existence of our argentaurum. If Mendeljeef's table be examined it will be seen that a vacant space exists in the subgroup of group 1, and that this vacant space stands immediately between silver and gold.

Our claim, as I have tried to make clear, is that the hitherto missing element is our argentaurum, which, in itself, is, therefore, neither silver nor gold, but which may, by our new physical methods, be converted into gold.

The question of cost is an important factor. Artificial diamonds, for instance, have been made of a purity and brilliancy which render them marketable at the highest prices, but cost of their manufacture hitherto has been in excess of their market value.

Thus the discovery has neither enriched those who made it nor affected the diamond trade. If in our case the cost of converting silver into gold is such as to more than swallow up the difference between the price of the raw material (silver) and the value of the manufactured product (gold), it is evident that it would not pay us to send gold into the market.

Our estimates, however, show us that a better fate is in store for us. We do not consume any chemicals and other costly materials in our process.

What we use is mainly energy in some of its various forms, such as heat, electricity, magnetism, gravity, cohesion, chemical affinity, X rays, and the like. Energy is cheaply produced nowadays, and may be had in any desired form by the combustion of coal.

When it is the question of applying energy to small masses the expense involved is very slight, and, as in the case of our work, we deal with ounces instead of tons, it will be obvious that the consumption of energy cannot be very large, although in the course of the process we may have at times to employ vast forces. Our chief source of expense is the time required for bringing about the desired molecular changes. But we hope when our working apparatus shall be constructed on a large scale to reduce the time factor to moderate limits.

No very close estimate of the cost seems to us at the present time to be practicable, but we think that it will not exceed a maximum of \$10 per ounce of silver treated, and we think it may very probably be reduced to \$5 per ounce.

We also estimate that the waste of argentaurum will not exceed the equivalent of 25 per cent of the silver treated. In other words, we hold that one ounce of silver will produce three-quarters of an ounce of gold.

The present price of silver is about 68 cents per ounce, and of gold \$20.67. But even if we were to give \$2 per ounce for our silver, our total cost in producing three-quarters of an ounce of gold would not exceed \$12. Thus, as three-quarters of an ounce of fine gold is worth a little more than \$15, it seems to us that we can reckon upon a profit at



least of \$3 per ounce upon all the silver we employ.

STEPHEN H. EMMENS.

In addition to this letter, a statement was published in the same paper, which we quote below, in which Mr. Emmens positively asserts that he can make gold out of silver, and adds:

"The metal which we have made from silver answers every test to which the United States Government Assay Office subjects the gold offered there for sale. It is, therefore, gold to all intents and purposes. This metal made from pure silver by the process discovered by us could be proved to be gold in a court of law. It not only answers every test of the government mints, but it also has every quality required by the gold of commerce, having the same color, weight and strength."

Dr. Emmens further says "he has already made 4 oz. gold from about 6 oz. of silver, and that the loss in the process is about 25 per cent." He was asked if he had himself tested his metal by the United States Government tests for gold, and he replied most positively that "he had, and that it had responded to every test."

In the issue of the E. & M. J., of the 12th ult. Dr. S. H. Emmens writes a characteristic letter of which the following are a few extracts:

"I thank you for your vigorous endeavor to impress upon your readers a conviction that gold cannot be made from silver. In my letter to you of August 25th, I expressed a desire for this conviction to prevail. I thank you for suggesting the possibility of politics or improper money-making being the 'word of the enigma.' This gives me the opportunity of saying what otherwise I could not have volunteered, namely, that in my arrangements with the friends who are co-operating in the establishment of the argentaurum laboratory, I have expressly declined to receive any personal remuneration. I do not, however, profess to be 'a disinterested seeker after truth' of the kind alluded to in my previous correspondence with you. If it shall happen that profitable results are arrived at in our laboratory, I shall, of course, receive my fair share of the same. I observe that you give notice of your intention 'in an early issue to refer at more length to the assumptions of Dr. Emmens as to what are the accepted teachings of science, and to the discrepancies in his statements of the basal facts in his own work.' I suggest, also, that before you publicly commit yourself to any final pronouncement based upon 'the accepted teachings of science,' you should well weigh what is to be learned from the silence of science. Dr. Lardner is said to have offered to eat his hat if a steamship should ever cross the Atlantic. Cyrus Field found little in the 'accepted teachings of science' to convince men of business, or even Mr. Carlyle's 'able editors' that an Atlantic cable was practicable. What did science know of argon—a substance that every philosopher and fool has been inhaling by the ton from time immemorial—until the other day? Did the X rays exist any the less because the 'accepted teachings of science' said nothing about them? In view of these and the numerous similar questions that any Vassar student could ask, I may, perhaps, 'give you pause' by making another 'extraordinary statement.' I have invented a 'force engine,' by means of which I can attain and utilize a pressure of over 500 tons per square inch. In saying this, I remain fully conscious of the

fact that there is no material, at present known to man, capable of forming an apparatus able to resist such a strain. Yet I adhere to my 'extraordinary statement,' and at no distant date, when the patent rights are duly secured by our syndicate, I will do myself the pleasure of showing you the engine at work, and of furnishing drawings and a description for your columns. What accepted teachings of science exist as to the molecular changes possible or probable in substances submitted to the action of such a force engine? And when I tell you that this new development of energy is only one of the tremendous and hitherto unemployed powers at the disposal of the workers in our argentaurum laboratory, you will, I think, feel less inclined than ever to follow the example said to have been set by Dr. Lardner. It may not be irrelevant for me to inform you that I long ago publicly predicted what I am now engaged in actually performing. In 1883, a London monthly magazine, *To day*, published two articles written by myself, viz.: 'A Vision of Space,' and 'The Modes and Might of Electricity.' If you will refer to these, you will find that my current 'extraordinary statements' are the logical sequence of very many years of philosophical work which began and was continued long before the present presidential contest appeared above the political horizon."

(Signed) STEPHEN H. EMMENS.

New York, Sept. 5, 1896.

## CORRESPONDENCE

### CALIFORNIA.

ISABELLA, KERN CO., CAL., Sept. 15th, '96.

EDITOR JOURNAL:—We note something of a revival of business here. The Los Angeles Gold Mining Company has all the large timber on hand for their mill two miles below this place. The ground has been leveled off for the mill site, the carpenters are on hand, the machinery is on the way and everything promises an early and vigorous campaign of industry on the Tom Lane and Mammoth mines at Keysville. Everything is planned on a scale for a forty stamp mill but I hear that only ten stamps will be started at present.

The Pioneer mine on the south side of Kern river five miles below here is promising well at the present time. The boys crushed eleven tons at Tibbets & Hooper's mill at this place and had \$1370.

Grove & Elsy have bonded and leased the Ross mine owned by Barton & Gibson and have every reason to expect to crush a good supply of 12-dollar-rock within two months. It nets them four dollars per ton to haul and mill this rock.

There was a meeting today, the 15th of September, of the miners of Keysville district and the inhabitants of Hot Springs valley for the purpose of putting a bridge across Kern river two miles below this place. Mr. Wilshire of the Los Angeles Gold Mining Company offered to pay for the timber at the mill and to deliver the irons on the ground and also pay fifty dollars of a carpenter's wages. Others volunteered to haul the lumber and do the grading and rock work, and it was resolved to go at it at once and have the road open for travel in two or three weeks.

It is expected that work will start in earnest on the Kern River & Los Angeles electric canal within the next six weeks.

SESPHEN BARTON.

## GENERAL NEWS

August 10th the Mint of Culiacan, State of Sinaloa, received three gold bars belonging to the "Anglo Mexicano" Company. The gold came from San Jose de Gracia, and was valued at \$60,000 gold.

A fabulous gold lead was struck in the New El Dorado mine, near Deadwood, South Dakota, a few weeks ago, and all the ore coming from the strike has been sacked and sent at once to the bank, being too rich to trust to the mill. From parties present at the time of the strike it is learned that the rock was richer even than the famous strike made at the Holy Terror two years ago, which caused the most notable stampede in years.

The Northwest Mining Association holds its Second Annual Convention, October 6th, 7th and 8th in the city of Spokane, Washington.

During the past year there has been appointed two hundred twenty-five Second Vice-Presidents in the mining districts, all of them within the States of Washington, Montana, Idaho, Oregon and the Province of British Columbia, each being the local head of a branch organization auxiliary to the main organization.

The production of copper from the mines of the United States for the month of July amounted to 37,175,000 pounds, against 35,896,000 pounds in June, an increase of 1,279,000 pounds. The production of foreign mines for July amounted to 16,472,000 against 15,680,000 for the preceding month, an increase of 792,000 pounds. Exports from the United States during July amounted to 24,382,400, against 21,952,000 in June, an increase of 2,430,400 pounds.

*Modern Mexico*, a journal published at Topeka, Kansas, giving the most reliable and authentic news and reports of Mexico has very kindly consented to exchange with us. The September number has been received. It is the second number issued under the management and ownership of Messrs. Paul Hudson and Wm. C. Smith. It is a magazine of twenty-four pages and gives evidence of enterprise and ability on every page. *Modern Mexico* is an all-round handsome publication, well filled with excellent pictures and reading matter, and can doubtless do a good work for the development of our neighbor republic. Success to *Modern Mexico*.

It is said that a capitalist once sent on a steamer from San Francisco to the Gulf of California an engineer and a stamp mill, saying to the former, "You have a mill, choose me a mine and draw for funds." The story is not credible, but such exaggerations are used occasionally to point out the follies or men. It is said that approximately 90 per cent of merchants fail. When folly is linked to folly, as in the case of the above capitalist and engineer, the enterprise must perforce go under. The great mistakes in mining, and those most frequently made, are: First, the hurry to get up some class of reduction works before the mine is sufficiently developed; second, mistaking the class of reduction works needed; third, overcharging the mine. There has been many a 10-stamp dividend-paying mine swamped under a 40-stamp mill. The capacity of a mill can always be enlarged, but the money expended in excess of capacity is forever lost.—*Western Mining World*.



## MECHANICS INSTITUTE FAIR

### A Grand Display of Home Manufactures at San Francisco, Cal.

#### A Description of different Exhibits as they Appeared at the latest Fair

The twenty-ninth annual Mechanics' Fair held in San Francisco will long be remembered as one of the best and most complete exhibits of home manufactures ever made on the Coast. California has gradually been extending her trade into the republics to the south and the demand for California manufactures has grown to such an extent that the manufacturers have felt justified in making everything there is a demand for instead of bringing it from the East. Although the progress in all classes of manufactured articles has shown a very satisfactory increase, the output of mining machinery has clearly forged ahead of all others, as the exhibit made by the foundries and machine shops at the fair plainly demonstrates. The handsome displays of machinery are all running and an opportunity is afforded all to see how the miner extracts the precious yellow metal from the worthless country rock. The first exhibit seen on the left side of the main entrance from the street is that of the

#### TUBBS CORDAGE CO.

They have a display of rope varying in size from the smallest imaginable to immense coils over eight inches in diameter. The company was established in 1856 and has had an increasing trade since that time. Their works are located at Potrero, a few minutes' ride from the centre of San Francisco. They do an extensive business with the mines not only in the United States but in South America, Mexico, Central America, British Columbia, Alaska and other foreign countries.

#### H. N. COOK BELTING CO.

Is the next exhibit encountered on the right side of the main entrance. They have a variety of leather belting and have everything very artistically arranged. This house has been in existence since 1860, and is well known all over the coast. They manufacture all of their goods in San Francisco and have equipped some of the large mines with belting, among others the Standard Consolidated Mining Co., Hidden Treasure Gravel Mining Co., the Webb Gold Mining Co., Soulsby Gold Mining Co. and the Golden Gate & Sulphuret Mining and Development Co., all of California. The Alaska Treadwell mine on Douglas Island, Alaska, also uses their belts. Their trade extends into Mexico and is showing a very satisfactory increase. Leaving this display on the left and going towards the main body of the building you next reach

#### FRED R. COOK.

This house is one of the oldest on the coast engaged in the manufacture of leather belting, packing and drapers. Although Mr. Cook is a young man he attends strictly to business and is building up a trade that will be a formidable rival to any establishment of the kind in the West. The house has for years past done business with the mines both in direct shipments and through the jobbers. They have furnished the great Utica mine at Angels, Cal., the Standard Consolidated Mining Co., Bodie, Cal., and through the mining

country generally. Mr. Cook is now working to extend his business extensively in Mexico. There is nothing of interest to mining men between this exhibit and that of

#### JOSHUA HENDY MACHINE WORKS.

By a great many this group of machinery is considered the finest in the hall, and the Joshua Hendy Machine Works certainly deserve great credit for taking so large a space and arranging the machinery to such good advantage. They have Triumph ore concentrators, Improved Challenge ore feeders, a Hendy improved triple discharge, two-stamp mill, ore cars, crushers, mortars for stamp mills, double-jointed hydraulic giants, shoes and dies and sawmill machinery of all sizes and kinds. The Hendy Machine Works is one of the largest and best known manufacturers of mining machinery in the United States, having been established in 1870. Their foundry and machine shops are located in San Francisco. They have long made a specialty of manufacturing mining machinery and sawmills, and wherever they have built one mill they have encountered little difficulty in obtaining other contracts in the same district. Among the many large plants that have been constructed by this company we can mention the following: The Lucille Gold Mining Co. at Plymouth, Amador Co., Cal., 40 stamps; Grand Victor Gold Mining Co., Placerville, El Dorado Co., 30 stamps; Nashville mine at Nashville, El Dorado Co., Cal., 20 stamps; Big Canon mill, Big Canon, El Dorado Co., Cal.; Webb Mining Co., Browne Valley, Yuba Co., Cal.; National Mining Co., Shasta Co., Cal.; La Trinidad mine, Placer Co., Cal.; Old Glory mine, Oro Blanco, Arizona, 30 stamps; Golden Cross Mining Co., Hedges, Cal., 40 stamps. They have also sent a great deal of sectional machinery to South America. Their sawmill machinery business extends all over the northwest and British Columbia and is rapidly extending to the southern republics. The Joshua Hendy Machine Works are also agents for the celebrated Wilson forged high grade shoes and dies made by the Western Forge and Rolling Mills in St. Louis. On the left and just across the aisle is the display of

#### L. P. DEGEN,

Whose well-arranged assortment of leather belting and rawhide lacing attracts a great deal of attention. Since 1876 this house has been doing a profitable business on the Pacific coast and no small amount of trade in foreign countries. They have furnished leather belting and other goods in all the mining camps of the west, and we noticed some well-known properties on their list. The Keystone Consolidated Mining Co., Amador Co., Cal.; W. Y. O. D. in Grass Valley, Cal.; Pioneer mine, Sierra Co., Cal.; Pennsylvania Mining Co., of Grass Valley, Cal.; the Orleans mine, also of Grass Valley, Cal.; Mammoth Bar Mining Co., Auburn, Cal.; Providence and Federal Loan mines of Nevada City, Cal., are a few of the California mines using Mr. Degen's belting. He has also shipped his goods to Japan, Honolulu, Mexico, British Columbia and China.

#### WASHBURN & MOEN MFG. CO.

Occupy the next space to Joshua Hendy Machine Works and across to the right from L. P. Degen. It is hard to know where to begin in describing the magnificent assortment that fills up this space. There is wire so small that you almost need a microscope to see it, and some so large that it puzzles the observer what it can be used for unless it is to swing

the world on. One of the most unique features of the exhibit is a large frame containing every known knot made with wire. This attracted a great deal of attention at the World's Fair in Chicago. The Washburn & Moen Co. have been established many years and are considered one of the solid concerns of the country. Their principal works are at Worcester, Mass., where they employ 6000 men. At Waukegan, Illinois, they have 3500 men, and in San Francisco, where their Pacific Coast works are located, they employ a small army of men. They manufacture every variety of wire for electricity, cables, springs, nails, and in fact anything made from iron, steel and copper wire. They have placed most of the wire cables on the large mines of the west, their list including mines from the extreme northern portion of British Columbia to the most southern point of Australia and New Zealand. They are now building a flat wire rope for a mining hoist in Colorado. It will be  $\frac{7}{8}$  in thickness, 8 inches wide and 1800 feet long. Against the wall of the partition that divides the large hall proper from the department where the machinery is running is the exhibit of the

#### PACIFIC SAW MANUFACTURING CO.,

Founded in 1855 by Messrs. Sheffield, Spaulding and Patterson. Their different varieties of saws and knives are tastefully arranged on the wall and the casual looker-on can readily imagine that some of the saws are made for looks only, as they are so beautifully finished and polished, yet these same saws when placed in position will cut any log that can be brought. When the Comstock lode in Virginia City, Nevada, was in its glory, the Pacific Saw Mfg. Co. did a large business with the different mining companies operating there. When it is considered that the Consolidated California and Virginia mine alone frequently used 200,000 feet of timber in one day, it can readily be seen that the demand for saws was great enough to give a large and profitable market for them. We were informed by one of the Pacific Saw Co. firm that their goods found ready sale in South America, Japan, British Columbia, Australia and Alaska. The second exhibit in the machinery building,

#### THE CALIFORNIA TULE ANTI-CALORIC CO.,

Have a practical demonstration of the value of their material for resisting heat. They have a steam pipe covered with their pipe covering, with a thermometer on the outside. By turning on the steam and looking at the different thermometers, of which there are four on four different exhibits, the adaptability of the different coverings for resisting heat and the insulating qualities are readily seen. Patents were applied for by Captain Wm. Borrowe in July, 1896 for this preparation, which is simply infusorial earth and tulle fibre. The company is manufacturing their product in San Francisco entirely from California products under patents controlled exclusively by them. On pipes over three inches in diameter the plaster is recommended instead of the sectional covering. Five per cent of asbestos is added to the plaster in making the sectional covering. This is only done to strengthen for handling. The different mining companies quickly discovered the value of the covering as a steam economizer, and it is now in use at the North Star mine, Grass Valley, Cal.; Amarillas, Sonora, Mexico; also the Minas Prietas, Sonora, Mexico. The great Anaconda Copper mine in Anaconda, Montana, is also using the covering, as well as the Amalie mine at Amalie, Kern Co.,



Cal. The Southern Pacific Railroad Co. and the Pacific Mail Steamship Co. are using the covering, and in every instance where it has been applied entire satisfaction has been given. Between the door entering the machinery building and the Cal. Tule Anti-Caloric Co. exhibit on the left is the only display of compressed air machinery, that of the

**RIX COMPRESSED AIR MACHINERY CO.** They have a compressor, hoists, rock drills, pumps, marble carving machinery and electric lights, all operated by compressed air. In the back against the wall is a large painting representing the past and present of rock drilling. On the one side is the miner pounding on his drill with a small hammer; on the other the miner taking his ease and allowing the compressed air drill to do the work. The Rix Co. have agencies in different parts of the west who handle their machinery. The progressive firm of L. Booth & Sons in Los Angeles are their representatives in Southern California. Compressed air machinery is beginning to be used extensively in mining, and as the old-fashioned element gives way to the progressive operator of the present day, so some of the old-fashioned ideas of power will be superseded by compressed air, which is clean, economical and especially healthful for mines, particularly in those where air is not very plentiful.

During the last two or three years the attention of the engineering public has been absorbed to a great extent by electrical apparatus and electrical phenomena. Compressed air has, by even eminent engineers, been considered to be an uneconomical means of transmitting power. This idea has in some way engaged the attention of the general public, and it is only within the last twelve months that the fallacy of this proposition is being well understood. The truth of the matter is that compressed air is now being used in fully as many branches of the art as electricity and there are hundreds of processes which depend for their economical value upon the use of this elastic fluid.

The largest power transmission plant in the world, viz., the one at Paris, of some 30,000 horse power, which is in active operation all the time, is one of compressed air. The pneumatic system of street car propulsion is now being tried in various cities in the United States with the greatest success, after having been in operation a number of years in Paris. The one at present running on 125th street, New York City, is pronounced by every one who has seen it, to be the most satisfactory for the traveling public.

There seems to be no end to the possibilities in the use of compressed air. It is not dangerous to use in any respect, either to property or to human life, it being the essential element of our existence, and while it gives forth power, the exhaust from the motor can be used for cooling purposes, and the entire energy stored within it made to yield up work of one kind or another. It is easily transported in ordinary pipes, at either low or high pressures, and in the high pressure systems more power can be carried for longer distances than by any other method of transmission known.

Under very high pressure it is used in the place of explosives, for handling pneumatic torpedoes in dynamite guns. It is the means of propulsion for marine torpedoes. Without the possibilities of compressed air caissons could not be sunk nor bridges thrown across rivers. In fact, in the light of modern engineering, it is fast becoming the most reliable and satisfactory source of power which we

have. There is a bright future for it, and a very satisfactory present.

Next in order on the left is

#### THE ELLIS CONCENTRATOR.

This machine, for which letters patent have been issued to the inventor and proprietor, is now ready for sale upon the market.

In general appearance it resembles the numerous traveling belt machines, but is constructed upon different mechanical lines, and calls into play other physical and philosophical principles not heretofore applied in the concentration of ores in like machines.

The machine is solidly built, the framework being entirely of iron, the sills upon which it rests being the only wood required.

The rubber belt upon which the pulp is conveyed from the battery or other pulverizing devices, is a traveling or moving one, as used on many other concentrators, but differs radically from all others, in that it is filled with small "batea" or pan-like depressions, and when the machine is in operation a gyratory or circular motion is imparted to the traveling belt, and to each one of the many bateas, so that the motion and the result produced is precisely like that imparted to the batea or miner's pan by the most skillful hand.

If during the operation any of the heavier metal bearing portions of the pulp or concentrates escapes from one of the bateas, it will certainly be caught up by some of the many hundreds of the others, and be perfectly separated from the gangue or lighter portions before it reaches the upper end of the traveling belt to be deposited in the receptacle attached to the machine for that purpose.

The concentrator works very rapidly, and from practical working tests it is demonstrated that the four-foot belt machine will handle from fifteen to twenty tons of ordinary pulp in twenty-four hours, and that the six-foot belt machine will take care of double that quantity of like pulp in the same time.

It has been shown that all the gold and amalgam which may escape from amalgamating plates of the mill will be caught upon the belt of the machine and deposited with the sulphurets.

The machine is not only a very rapid but a very close worker, and the values saved, as shown by various tests upon ores difficult to concentrate, were upwards of 90 per cent.

An apparently difficult, yet thoroughly successful test of pulp carrying thirty per cent of zinc and ten per cent lead, from one of the leading mines of Utah, was made upon this machine, and the galena was thoroughly and speedily separated from the zinc and cleanly deposited in the sulphuret box.

For further information touching this concentrator, application may be made to Henry Rives Ellis, the proprietor, at his metallurgical works, 318 Pine street, San Francisco, California.

The machine may be seen and examined at the Golden State and Miners' Iron Works, San Francisco.

The Midas Gold Saving Machinery Co. come next. Their principal exhibit is the

#### GOLD KING AMALGAMATOR,

Which, although it has only been established a few years, has already taken a firm hold of the mining public.

They do not offer a new method of saving gold, but employ means that are well tried and proven, but they do offer a new mechanical device accomplishing the two essentials in plate amalgamation, that is repeated contact with the amalgamating surface without scour-

ing, and ignoring specific gravity. The interior, or plate construction of the Gold King Amalgamator is of such form that the material which is fed into it does not lay on the bottom only of the plate surface, thereby allowing the cylinder to revolve around the pulp, neither do they force their amalgamating surface into the pulp. The entire mass of pulp with this amalgamator is given a continual forced contact with the plate surface, at the same time upsetting all of the material repeatedly, and at every instance allowing a fresh and different contact. The upsetting of the material is accomplished by four radial wings or flanges running the entire length of the plate, and are placed at equal distances apart. These wings are a component part of the plate and cannot be moved, each plate being a solid piece of copper and containing 16 square feet of amalgamating surface, making 32 square feet of plate surface in each No. 1 amalgamator, which is electroplated with 1½ ounces of silver to the foot. With this amalgamator, everything that passes through it is given from 150 to 300 positive and absolute contacts thereby securing everything capable of amalgamation. In fact, they can save gold by this method that is microscopic in its fineness as well as floured gold and mercury. They manufacture these amalgamators in the following sizes: No. 1 Amalgamator contains 32 square feet of plate surface, and requires ½ horse power to operate it, and is capable of handling all of the pulp from one battery; its weight, crated for shipment, is 1000 pounds. No. 0 Amalgamator, which contains but 16 square feet of amalgamating surface, and is operated by hand power has a capacity for handling from five to seven tons in ten hours. A triple-acting pump is attached to this size amalgamator, as it is intended and built for a prospecting machine only, and not for quartz mill purposes. Its weight, crated for shipment, is 350 lbs. Tests are made free of charge of ore pulp, tailings, or sands.

Starting at the back of the Gold King Amalgamator, and running sixty feet west to the other entrance from the main building to the mining machinery building, is the

#### HALLIDIE PATENT WIRE ROPEWAY

In operation. This ropeway is made by the California Wire Works, who were established in San Francisco in 1852. The ropeway has been in operation in various parts of the world since 1871. The factory of the company is at North Beach, California. The ropeway is almost indispensable in some mountainous countries, where it would be impossible to transport ores from the mines to the reduction plant. It is coming into general use also for transporting dirt taken from hills to be used in filling low places. A large number have been sold to the mines in British Columbia. At Nelson, the Hall Mines (limited) have a ropeway five miles long, in two sections, with a capacity of 150 tons per day. It has 925 buckets, and the wire rope is one inch in diameter. The San Juan Mining Company, in Bahia, Lower California, are operating one, 12,365 feet long; La Compania Minera de Panuco, Panuco, Sinaloa, Mexico, have one 14,000 feet long. At the works, one is in course of construction, for the Consolidated Mining & Smelting Company, of Brigham, Utah, it will be 8,000 feet long. The ropeway has been introduced in all parts of the world, and has proved a great success and labor-saver everywhere. In front of the Hallidie Patent Wire Ropeway, and next to the Gold King Amalgamator, going to the west, on the left hand side, is the



## HICKS' GAS ENGINE

Attached to an electric plant. This gas engine was brought into the market in 1892. It is a home product, and is manufactured in San Francisco, and can be used with gas, gasoline, distillate, or crude oil. It is in use in Plumas County, California, working a hoist on a mine, also in Carson City, Nevada, where it is used for pumping and hoisting. The engine is being extensively used all over the coast, and will be in general use in the mining districts, as soon as its merits are brought to the attention of the miners. The exhibit next to the Hicks is

## C. H. EVANS &amp; CO.,

Who manufacture all kinds of pumps. At the left side of the entrance to their space, under a glass case, are nine handsome medals; 1 gold, 6 silver, and 2 bronze, which are prizes that have been won by the displays of the firm at different places. They have a twin cylinder pump, and a large assortment of every kind of pumps on exhibition. The firm has been established since 1870, and manufacture all their pumps in San Francisco. Many of the large producing mines of the United States and Mexico are supplied with pumps from this house. The Ybarra mine in Lower California, is equipped with their pumps, also the great Santa Juliana mine, at Jesus Maria, State of Chihuahua, Mexico, the Lee mine, in Placer County, California, uses their pumps, and the Lava Bed Gravel mine, in Calaveras County, California, is using one of their hoisting plants as well as pumps. The firm has a well established reputation for honesty, and when they send out a piece of machinery it is always found as represented. Their trade extends all over the continent and into foreign countries. Still continuing west from the display of C. H. Evans & Co., one of the most interesting features (to a mill man) of a quartz mill is met with in the space allotted to

## G. W. PENNINGTON &amp; SONS.

The most annoying thing that can happen at a mill is to have everything in good running order, and, after starting up, have a shoe break off at the shank, as many cheap shoes do, the Pennington Brothers have worked hard to introduce a shoe and die that will do the work without battering up or clipping off, they also guarantee the shoe not to break off at the shank. Their shoes and dies are put in the desired shape under a large steam hammer, after which they are put through certain processes, which they control, which hardens them and closes in the grain, rendering them compact and very dense. The great advantage of good shoes and dies is particularly felt in districts where the transportation is high, as it costs no more to carry a shoe and die that will last one hundred and twenty days than one of equal weight that will wear out in half that time. The shoes and dies of Geo. W. Pennington & Sons have found favor wherever used, and new orders have resulted where the goods have been sold. Messrs. Pollard & McTigue, of Silver City, Nevada, are using their shoes, also the Texas mine, in Shasta County, California. They are at present filling several large orders for different mines on the mother lode. Their trade is steadily growing, and they now have their shoes and dies in use from Oregon to Mexico. They also make cam shafts, crusher plates, and best refined tool steel, drill and chisel steel, hammer, pick, machinery steel and iron and steel forgings of all descriptions. In front of this exhibit is that of

## GEORGE CUMMING &amp; CO.,

Manufacturers of portable forges. This firm was established in San Francisco fourteen years ago, they also have a factory in Chicago. Their display at the fair is composed of a full line of portable forges, which are used extensively through the mining districts. The forges are especially adapted for prospecting, as they are light, and can easily be transported on the back of a burro. The prospector is always noted for his dull drills, as he has little opportunity to sharpen them, but this forge allows him to always have them sharp. George Cumming & Co. also manufacture hydraulic machinery and blowers. Their goods are well established all over the coast.

## FULDA BROTHERS

Are in a west extension of the machinery building, and have one of their large wooden tanks, with patent band and hoop coupling, together with zinc extractor boxes for the cyanide process on exhibition. Since 1866, this firm has been engaged in building tanks, and have put them all over California and the southwest. The South End mine and the Standard mine, both of Bodie, California, use the goods of Fulda Brothers, also the Utica mine, at Angels, California, which is probably the best dividend-paying gold mine in the world. In Arizona the Detroit Copper Co. at Morenci uses their tanks also. With the development of the cyanide process in the last few years the trade for cyanide tanks has naturally increased very greatly, and this enterprising firm have kept pace with the demand and have both their water and cyanide tanks in every mining camp where there is any demand for them.

## I. S. VAN WINKLE &amp; CO.

This firm, which is one of the oldest established iron houses west of the Rocky Mountains, having been established in 1849, have a large space in the machinery annex occupied by their Kinkead mill, Daniel Best crude oil engine and Springer Concentrator. This company, realizing the demand that would be created for mining machinery with the great development on the Pacific coast and the southwest, have added a mining machinery department to their extensive business, and intend to depart from their usual custom of making nothing but high-priced machinery that is only within the reach of the capitalist or miner of large means, and will devote themselves to turning out engines, mills and concentrators for the prospector, who, as a rule, has a lode on which he can make good pay if he can devote his own time to the milling instead of paying five dollars per ton to have it milled at the custom mill. The desert mining regions offer great inducements to miners when they know that they can at a nominal expense extract their own gold, and it is the intention of Messrs. I. S. Van Winkle & Co. to cater to this class of trade.

The parent plant of the Kinkead mill is working in Virginia City, Nevada, crushing waste rock from the Consolidated California and Virginia mine, the property from which the bonanza kings Mackey, Fair, Flood and O'Brien made their fortunes. The waste rock on which the four Kinkead mills are running was considered too low-grade to put through the regular milling process. The four mills are crushing forty tons of rock daily, using only eight horse power. The Springer concentrator is in operation at the famous Bald Eagle mine in Alaska. At the Cedar Valley gold and silver mines at Yucca, Arizona; at Marchant & Sexton's mine, Redding, Cal.,

and many other places through the mining territory. The Daniel Best crude oil engine has long been a favorite in the mines on account of the positive power which is essential in the engine lifting a hoist. Over six hundred Daniel Best engines have been sold on the Pacific slope, Mexico, Japan, China, Australia, Central America and Alaska, and it is recognized as the most economical power ever produced. The latest addition made to their mining machinery department is a light and very portable prospector's five-stamp mill, which can be transported anywhere. This mill will be sold complete for about \$400, and enables the prospector to develop his mine and realize daily sufficient for all expenses instead of waiting a month for his returns when he ships to distant points.

Starting in the machinery building again and going east the

## PACIFIC AMALGAMATOR CO.

Occupies the first space on the left. This company deserve great credit for their exhibit, which is the only one in the mining and machinery department from out of the city. The office, salesroom and factory of the company are in Los Angeles, which is almost at the southern end of the state. They have one of their amalgamators in full operation at the fair.

In presenting this machine to the public, they cordially invite the most careful and thorough investigation by mine owners and amalgamators, of the scientific principles embodied therein. In order to save fine gold it must be brought into contact with the amalgamating material. Therefore, thorough agitation of the pulp, and a large exposure of fresh, clean amalgamating surface is necessary to accomplish the best results.

With their standard machine cylinder 12x46 inches, at 15 revolutions per minute, 360 square feet of bright, clean amalgamating surface is exposed to contact of the pulp every minute, the pulp being fed directly upon the plate as it emerges from the water, washed clean and bright thereby.

The machine is arranged below the battery to receive the discharge therefrom, and is especially designed for the purpose of saving that class of gold which has heretofore been deemed practically impossible to save. When the amalgamator is used, the ordinary apron plates are dispensed with, and it is unnecessary to provide sluices or shaking tables.

Coarse free gold can be saved without difficulty, but fine flour or flake gold must be scientifically handled or it passes off in slimes or floats away with the water, thus rendering many mines, rich in fine gold, unprofitable to work.

In presenting the Pacific Amalgamator to mine owners, they confidently assert that for saving fine gold it has no equal.

By an improved arrangement, the pulp passes over amalgamating plates the pitch of which can be regulated to suit, and by means of adjustable gates is forced, under pressure, into contact with numerous baths of quicksilver, after which it is delivered to a rotating amalgamating cylinder, which is so arranged that not a particle of free gold, however fine or flaky, can escape amalgamation.

This cylinder, although provided with series of wings, is so arranged that the wings can be quickly removed and the amalgamated surface of the cylinder left smooth and unobstructed for cleaning up.

The Pacific Amalgamator is the result of careful and practical experiments, extending over a series of years.



Various theories have been explored and abandoned, and many different constructions devised, and the Pacific Amalgamator embraces all the features which have stood the test of practical working, and none of those which failed in the slightest particular.

By a simple yet ingenious arrangement, the Pacific Amalgamator is converted into a placer mining machine of superior utility. At the top of the machine is a mixer and a scourer. A suitable screen is arranged to screen out the boulders and to prevent them from passing to the scourer. From the scourer the material passes to the under screens, which are just beneath the cross-pipes.

Water is discharged through the cross-pipes, which swing to and fro and wash the fine material through the screen, and to the amalgamator, which is arranged out of sight below the screen. The gravel passes on down to the steel riffles, which are in plain view at the front of the machine, and the water and fine material, after passing through the amalgamator, discharges upon the riffles and washes the coarse material down and out of the machine.

In presenting this machine to notice, they wish to call attention to the following advantages which it possesses over any device of this class heretofore in use:

It can be readily taken apart and transported by pack-train, or otherwise, and can be set up by any ordinary mechanic.

Is adapted to work any class of placer ground, since the machine does its own screening, and treats each separate class of material according to its requirements.

Pebbles and coarse material do not pass through the amalgamator to scour the amalgam off the plates, but pass, instead, over steel riffles, which will last for years and will catch every particle of coarse gold.

Fine material all passes through the amalgamator. All material is thoroughly scoured before passing to the gold-saving appliances, thus adapting the machine for cement gravel or talcy tailings.

Gravel is thoroughly washed while passing over the screens, the fine material and water passing through the screens to the amalgamator, while the gravel and other coarse material, comparatively dry, passes down to the steel riffles where it is again washed by the water discharged from the amalgamator. They assert that no other machine of like capacity can be successfully operated with so small a supply of water.

Durability: The machine is almost wholly metal and though light, is strongly constructed.

Clean-ups can be quickly and conveniently made.

Shifting jets from rocking spray-pipes insure thorough washing of gravel with small expenditure of water.

Balanced shaking screens. Amalgamating plates and riffle board, adjustable as to pitch. Adjustable feed.

Simple, light running, convenient, portable, economical, as to water, thorough amalgamation.

They guarantee their machines to save 95 per cent of all free gold contained in the material run through, it matters not how fine the gold may be.

THE PROSPECTIVE MINING AND MACHINERY COMPANY

Are in front of the Pacific Amalgamator Co., and have one of their Tremain steam stamp mills on exhibition. This company started in the business of manufacturing mining ma-

chinery in 1889, and have had a good sale for their steam stamp, which is their specialty. The proprietors state that many devices have been made to do the work of the cam mill by direct application of steam and that they have not proved a success. In the Tremain stamp the work is accomplished by the exhaust steam. They use two stamps, each of which has a stamp stem. The weight with piston, piston-rod and other attachments is 300 pounds each. The steam is taken from the boiler and admitted to the under side of the piston which raises the stamp. When it has reached the top of its stroke, by an ingenious device the steam which has already been used to lift a stamp, is now conveyed to the top side of the piston, which has a much larger area than the under side, and a blow is struck by the weight of the stamp, urged by the steam pressure of 1,000 pounds under ordinary boiler pressure. The height of the Tremain stamp mill is 7 feet 6½ inches, its base is 18x22 inches, its screens consist of one 14x18 and two 14x7; the weight of the mill with feeder is about 2,700 pounds. The complete plant for operating the steam stamp on free milling ore consists of boiler, steam stamp, copper tables and retorts. The steam power required is about four horse power. The mill is very thoroughly distributed around the mining country. In Josephine county, Wyoming, six mines are equipped with them. They are running in Georgetown, British Guiana, and several are at work near Johannesburg, South Africa; in Canada, Alaska and Mexico, also in Central America. In California they are in operation in Clarkeville, El Dorado county, and at San Andres, Cal., one is working on cement. At Cow Wells, Kern county, Cal., a mill has just been erected for custom work. One is now being shipped to Central America. The company have many testimonials from users, all of whom express their satisfaction with the plant. The space on the side of the Tremain steam stamp is utilized by the

GOLDEN STATE AND MINERS' IRON WORKS, Who have a Harding Gasoline engine working a hoisting plant. These works have been established in San Francisco since 1863. They make a specialty of mining machinery and the Harding gas engine, and are thoroughly equipped to build at short notice, pumping, transporting, crushing and amalgamating machinery. They equipped the Bunker Hill mine in Amador county, Cal., with a 40-stamp mill; the Esperanza mine, Calaveras county, Cal., with a 30-stamp mill. They furnished the Waihai Gold Mining Co. of New Zealand with their 60-stamp mill. In Amador county, Cal., they erected the hoisting works for 1500 feet in depth on the Gover Mining Co.'s property. They also furnished the 20-stamp mill for the same mine. They are now building a large dredging plant for Japan to be used in deepening the channel of the harbor of Nagasaki. They are at the present time also putting in a tandem compound slide valve Corliss engine of 400 horse power for the Mutual Electric Light Co. of San Francisco. Their trade extends all over the western mining country and up and down the coast and from Australia to British Columbia.

Of the enterprising machinery houses in San Francisco, the

KROGH MANUFACTURING CO.

Must be considered among the first. They are between the Tremain Steam Stamp and Golden State & Miners' Iron Works on one side and the Hewson Multiple Expansion

Steam Turbine on the other. Their display consists of one large engine, deep well centrifugal pump, wine pump, ore buckets and little giant rock breaker and pulverizer, for assayers and miners' use. They manufacture deep-well pumps, cornish pumps, triple acting pumps, special mining pumps, hoists, link chain elevators and conveyors. They make a specialty of prospecting mills and hoisting machinery, and intend in the near future to embark largely in the manufacturing of all kinds of mining and milling machinery. The house is an old one, dating from 1876. They are now making especial arrangements to handle the Mexican trade that is coming to San Francisco. One of the proprietors is familiar with the Spanish language, and they are starting to build up a business that can extend to Patagonia on the south. They have had a long and practical experience in building machinery, and have given perfect satisfaction wherever they have placed their goods. They furnished the Congress Gold mine, at Congress, Arizona, with their pump for the cyanide process. The Tom Boy mine, at Telluride, Colorado, is using their pumps, also, they recently furnished a large reclamation pumping plant for the Sutter Island reclamation district. This was the most efficient and economical plant of the kind ever erected on the Coast. Their trade now reaches all over the west and southwest and is growing very satisfactorily.

THE HEWSON MULTIPLE EXPANSION STEAM TURBINE.

When the water turbine was brought into general use, it was considered to be the most economical application of power possible to find, but we have advanced since then, and now find that steam can be furnished cheaper than water in many places. This steam turbine is the invention of Robert Hewson, of San Francisco, and is the result of the experiments carried on by him for the last ten years. Turbines were built from 16" to 7' diameter, and tested for difference of power and stretching of the metal. He found that a diameter of 60" was the greatest which could be used and insure a good casting. The principle of the Hewson steam turbine may be briefly stated as follows. To so apply a gas under pressure that its velocity and expansive force may be utilized to rotate a disc, the peripheral velocity of the rotating disc to be 55 per cent of the velocity of the gas. This velocity is necessary only when the expansion, and consequently the velocity, of the impelling fluid is comparatively rapid. The impingement and expansion of the gas must, like the motion of the disc, be continuous and regular. To utilize the expansive force of steam was found to be the main problem. The power of the turbine does not depend upon the diameter but upon the pressure and the volume of steam applied to it. A theoretically perfect steam turbine is one designed to gradually expand the steam, to arrest it elastically. Some of the advantages of the steam turbine may be stated as follows: Total absence of vibration; no concrete foundation necessary; no oil can pass to boilers, as there is no internal lubrication; wear and tear reduced to a minimum; small space occupied; the great reduction in weight; small cost of production; is not affected by the presence of any water which may be carried over with the steam; great range of temperature through which the steam is worked; the ability to use highly superheated steam. This steam turbine furnishes a cheap and simple motive power for hoisting works, and



all power to be applied to mining and milling. It can be belted to any ordinary standard type of dynamo, and will give perfect satisfaction. The governing device is sensitive, and the speed much more uniform than can ever be attained in the ordinary engine. There is a very small piece of machinery between the Hewson Turbine and Union Iron Works exhibits, which is not noticed by many, partially because it is in an obscure corner and because it is so small, it is

#### THE VANDUZEN STEAM JET PUMP.

The E. W. Vanduzen Company, of Cincinnati, Ohio, who manufacture the pump, were established in 1837, and the Vanduzen steam jet pump can be found in every state in the Union, and in all parts of the world. They are very simple and require no experience to operate—when you turn the steam on, it works; when you turn the steam off, it stops. It is the cheapest pump in the world, as they are sold as low as \$7.00, and this small device will elevate 200 gallons per hour. For a poor prospector, who has steam power, they are invaluable, as there is nothing to break or get out of order, and they are always ready for use and need no mechanical skill to handle them. Mr. James Linforth, of 37 Market Street, San Francisco, California, is the general agent for the Pacific Coast, and will cheerfully answer any inquiries addressed to him, and send full information about the pump. One of the most complete miners' exhibits in the fair is made by the

#### UNION IRON WORKS.

They have a 2-stamp prospecting mill pounding away all day on ore. The mill is complete in every detail, has amalgamating plates and a concentrator, to save the sulphurets. The stamps on the mill weigh 250 pounds each, and the whole can be carried anywhere. It is especially adapted for prospectors who only desire to lay out a small sum for a mill. The Union Iron Works grew up in San Francisco with the first discovery of gold, and has been growing ever since. They employ a large number of men at Potrero and have competed successfully against the big shipyards in the east for the building of battle ships for the United States navy. The last one they built, the Oregon, surpassed the speed she was built to attain, and the workmanship was satisfactory in every way. They have several exhibits at the fair, the most interesting one, to the casual observer, being their shipyards and works at Potrero, in miniature, covering a space thirty feet square in the northeast end of the building. They also have miniatures under glass of the different vessels they have built, and at the west side of the machinery building, they have a magnificent display of electrical machinery, of the Siemens system. As builders of mining machinery, they have been fully as successful as in boat building, and their plants extend from one side of the continent to the other and in most parts of the world. They built the mills of the famous Consolidated California and Virginia mine, at Virginia City, Nevada. It was 80 stamps, with a capacity of  $5\frac{1}{4}$  tons to the stamp in 24 hours. The two large hoists at the Anaconda mine, at Anaconda, Montana, were built by the Union. They also built the 100-stamp mill, of the Compania Huanchaca de Bolivia, in Bolivia. The mills at the Minas Prietas, in Sonora, Mexico, were built by them, as well as some of the largest on the Mother Lode in California. They furnished a short time ago the mill for La Fortuna mine, north of Yuma, Arizona, which was bought as a

prospect for \$150,000. They have every facility for turning out any kind of work in the best possible shape. If any miner were asked which is the best-known mill, outside of the stamp, he would say the

#### F. A. HUNTINGTON CENTRIFUGAL ROLLER QUARTZ MILL.

Which is running in the next space to the Union Iron Works. Mr. Huntington has two mills and a crusher in his display. He has been in the machinery business in San Francisco since 1865, and has been manufacturing the Centrifugal Mill thirteen years. His mills are in use at most of the mines in the Western States and Territories, and have had a good sale abroad. His improved mill has many advantages over the old style. The mill has always been a favorite in the mountains, where transportation is high, on account of the light weight as compared to other mills of the same capacity. Mr. F. A. Huntington himself is known wherever there is a mine, both in the United States and in Mexico, and his generosity in dealing with the miners has made him many warm friends. At the Tom Boy mine, in Colorado, eight of the mills are in use, over fifty have been shipped to Australia, also several to Austria. The mills are also running in Norway, Japan, Mexico, South Africa, South America, Nova Scotia, Italy, France, British Columbia and Central America. In the United States they are operating in the following states and territories: Alabama, California, Colorado, Connecticut, Idaho, Iowa, Michigan, Missouri, Montana, New Mexico, North Carolina, Nevada and South Dakota. The mill is manufactured in San Francisco, and is a home product. Making mining plates for amalgamation is something for which it is absolutely necessary to have a good reputation for, in order to be successful, as the requisite amount of silver is not always put on the copper plate.

#### THE SAN FRANCISCO PLATING WORKS

Is a firm which is thoroughly reliable, having been established thirty years ago. They make a specialty of mining plates and are known wherever plates are in use. Mr. E. G. Denniston, the proprietor, looks after his own business and knows all his customers. His display at the fair is in several different places and is the only thing of the kind on exhibition. The plates from the San Francisco Plating Works have been sent to South America, Australia, Mexico and all parts of the United States. They are now getting out an order for a Mexican mine near Mazatlan, Sinaloa. One of the first orders given by the Alaska Treadwell mine of Douglas Island, Alaska, was sent to this house. Their trade is very extensive and has grown steadily with the development of the mining industry on the coast and in the west generally. Going east from the F. A. Huntington mill the next exhibit is

#### THE WOODBURY CONCENTRATOR.

They have two six-foot machines displayed, one being what is known as the in shake and the other the side shake. The Woodbury is in some localities considered indispensable on account of the peculiar character of the ore. There is probably no piece of mining machinery about which there is so much controversy as the concentrator. Some claim advantage for one kind and some for another, and the consequence is there are new ideas being patented continually and every device is resorted to to create a movement that will tend to concentrate and hold the valuable metal on the belt until it is dropped in the

box under the machine. The Woodbury concentrator is entirely different from any other, inasmuch as it consists of a number of small belts, instead of one large one. If the sulphurettes do not work properly on one of the small belts it can be adjusted without disturbing the others that may be working well. All the other devices differ only in size and movement, but the belts are all single. Mr. Geo. E. Woodbury, the owner of the belt, is a practical man himself, and takes great pride in his concentrator. He started to build them in 1876 and has been making changes and improvements ever since until now he has a machine which seems to combine every possible movement that could be given for the concentration of ores. He has been generously patronized through the mining camps and we find his concentrator in use everywhere. He manufactures his machines in San Francisco, and has his office at 141 First Street. In Sydney, Australia, his concentrator is in use at the Rand Drill and Rackarock Co. Many of them have been sent to Mexico. In the United States they are in use in California, Colorado, Oregon, Arizona, Idaho, Nevada, Washington and other places. The Woodbury is also made in Denver, Colorado, the well-known firm of Hendrie & Bolthoff doing the manufacturing for Mr. Woodbury. Almost in front of the main entrance to the machinery building and next to the Woodbury concentrator the

#### JUDSON MANUFACTURING CO.

Have some unique displays, among others a tack machine and small nail machine, which turn out the finished product as easily as cutting hay. The works of this company are at Emery Station, Alameda county, Cal. They have been in business since 1882 and are prepared to fill any order they receive for almost anything. They employ 400 men in their rolling mills, foundry, machine shops and bridge and nail factory. They manufacture an iron mining car which is becoming very popular in the mines. They also manufacture rails and other supplies for the mines and have shipped their mining goods to Mexico and all along the coast. We now come to a display which will puzzle the judges in awarding prizes, not on account of it being so extensive, although the space occupied was as large as any other exhibit at the fair, but on account of the perfect arrangement and taste exhibited in the placing of the different articles, which can be seen from any side and walked around.

#### THE RISDON IRON WORKS

Occupy the entire eastern end of the Machinery building and have their massive displays well arranged, the Heine water tube boiler is all set up ready to run and occupies the entire depth of the space running from the main entrance on the right to the end of the building, two large hydraulic giants stand in the middle and look as though threatening to flood the house. The other exhibits are a Johnston Concentrator, hammered steel shoes and dies, Bryan roller quartz mill 5 foot and batteries for mills, together with mining plates, manufactured by the San Francisco Plating Works. The Risdon is among the largest machinery houses in the Union and has been established ever since there was anything in California. Their immense works, which occupy an entire block are in the city of San Francisco. They have built some of the most extensive plants in this country, and are the largest manufacturers of riveted steel pipe in the world, having a capacity of 2 miles of 40 inch pipe per week, they built the largest hydraulic pump ever con-



structed, for the Chollar, Norcross and Savage companies, of Virginia City, Nevada, it has a capacity of 3500 gallons per minute from a depth of 4000 feet, they also built the Alaska Treadwell Mill on Douglas Island, Alaska, of 240 stamps; this mill last year crushed 263,670 tons of rock at a cost of 34 $\frac{3}{4}$  cents per ton. They are now putting up hoisting works on the Anaconda copper mine at Anaconda Montana, the hoisting works have 3000 horse power, they have placed 60 stamps in Angels Camp, Cal., they built the Pacific and Plymouth mills, at Plymouth Cal., 40 stamps each, also the North Star Empire and Idaho mills of 40 stamps each at Grass Valley, Cal. This company also makes a specialty of equipping hydraulic mines. They built the famous Evans hydraulic elevator at the Golden Feather river at Oroville, Butte Co., Cal. They put in a Heine boiler of 4000 horse power for the Edison Light and Power Co. of San Francisco, some time ago. Their trade extends all over the world and they keep pace with all modern improvements. This is the last display in the Machinery building proper the

#### BOWERS RUBBER COMPANY

Being in the main building and just across from Joshua Hendy and Washburn and Moen's exhibits. This assortment of rubber goods is very much noticed on account of the large space it occupies and the variety of the articles displayed; one of the most interesting features is the crude rubber mill which is in steady operation with an attendant to feed it, at one side of the machine is piled a lot of crude rubber and beside that a heap of pure rubber, washed, ready for making into goods; some very fine samples of hydraulic hose in two sizes, one 11 and the other 17 inches in diameter are shown, three concentrator belts, rolls of rubber belting and a machine making rubber belting; at the time we visited it there was a four-ply belt being made. The belts are afterwards vulcanized and stretched at their factory in a hydraulic press which weighs seventy tons. The Bowers Rubber Co. was established in 1888. Their works are in the city of San Francisco, where they employ a large number of men. Their specialties in the mining line are concentrator belts, packing, belting and hose. The Alaska Treadwell mine in Alaska has their goods in use, also the Utica mine at Angels, Cal., the Champion, Providence and Kennedy, all prominent California mines use their rubber; their shipments extend to Mexico, Australia and British Columbia, and their house brings a great deal of trade to San Francisco, they also do a very large business in supplying the jobbers in San Francisco who transact business with the miners. This exhibit finishes all that are connected with mining with the exception of two which are at a distance from those already described. On the left hand side of the west door leading from the main exhibit hall to the Machinery building the

#### PARAFFINE PAINT COMPANY

Have arranged a display in a practical and business like way. They have their ready roofing, paint, manilla paper and pile covering all arranged so as to be easily inspected by the public. This Company is the best known in their line on the Coast, both on account of their liberality in advertising and on account of the durability and economy of their roofing, which is their specialty. We have seen quartz mills covered with this roofing which has stood vicissitudes of temperature ranging from 120 degrees of heat in the summer to 20 degrees below zero in the winter. The establishment of the firm dates back over ten years. Their works are at Golden Gate,

Alameda Co., Cal. They have furnished roofing for many of the best known mining companies on this continent; among the copper mines are the Detroit Copper Co. of Morenci, the Arizona Copper Co. of Clifton and the great United Verde of Jerome, all in Arizona, also the Anaconda at Anaconda, and the Boston and Montana both in Montana. The Moctezuma Concentrating Co. of Nacosari, Sonora, Mexico, the Anglo-Mexican Mining Co., Sinaloa, Mexico, the Crescent Colorado, Mexico, the Utica Mine, Angels, Cal., the Kennedy Mine, Cal., and the Bi-Metallic Smelter, Leadville, Colo., all use their materials. They have also furnished the British Columbia Smelting and Refining Co. of Trail, British Columbia, the Alaska Treadwell Mine, Alaska, also mines in Australia, New Zealand and Central America. Nearly all of the Cyanide plants through the mining regions are roofed with their goods.

Their branch house in Los Angeles is managed by Mr. E. G. Judah, who is considered one of the brightest young business men in Southern California. He travels through the mining country himself and is thoroughly familiar with the needs of the miners; this fact gives him many advantages in obtaining orders and he is building up a large business for his Company in the South-West. We now come to the last exhibit which is by no means the least in importance to the miners, and in fact mining in some instances would be almost impossible without the class of instruments manufactured by

#### J. C. SALA,

Whose exhibit is in front of the band stand and almost in the centre of the main building, a large glass case is placed at a convenient height in which he has different kinds of technical and scientific instruments, one of the most interesting to an engineer being the mountain and mining transit which should be in the office of every mining company, the knowledge of the use of the transit often saves hundreds of dollars as the miner knows exactly where he is at all times with the instrument to keep him straight. Besides all kinds of instruments for mining they also manufacture thermometers and standard rain gauges and are prepared to make any scientific instrument which requires accuracy for mining engineers and surveyors. The house was established in New York in 1834 but came to San Francisco six years after the discovery of gold. Their trade extends all over the world and the demand at home is likely to increase on account of the number of mining engineers who graduate every year from Berkeley and Palo Alto and require instruments for their professions.

In summing up the exhibits one cannot but realize the delicate position of the judges as all the exhibitors have striven to excel in their different lines. Fairs of this kind can not but be beneficial, bringing as they do the manufacturer and consumer into closer relationship and we sincerely hope next year will find us with the California manufacturers at the fair again and that the same intelligence, energy and enterprise that has characterized and made a success of the present one will be repeated in 1897. San Francisco is the gateway to the richest mineral country on the face of the globe and California, combined with all its natural advantages, has the most progressive manufacturers who work together as a unit for the advancement of the fair country in which they live.

In conclusion we wish to thank the different exhibitors for their universal courtesy in providing information without which a de-

scription such as we have attempted could never have been accomplished.

## Miscellaneous Mining News.

### ARIZONA.

The Arizona Mining company now obtains a large portion of the mining timbers required near at home instead of at Flagstaff. At Iron Springs Siding, a dozen miles south of Prescott, are great piles of hewn and split pine timber and logs, cut for the uses of the Congress mine even better for the purposes than sawed lumber and saving much in freight.

At the Congress mine the shaft is now down 1,800 feet and 350 men are employed under ground. In addition to a cyanide plant with a capacity of 100 tons there is a forty-stamp mill which runs night and day and forty more stamps are to be added. About four miles of tunnels, shafts and stopes have been run. Besides the 1,800-foot shaft, two others have been sunk to the depths of 700 and 1000 feet respectively. Cross cutting to the second vein has been commenced. The present output of the mine is \$80,000 per month.

A quartz mill of ten stamps is now being erected in Lost Gulch, which is about seven miles northwest of Globe city, on the group of mines owned by the Kasser Gold Mining company.

The Bonita mine, about six miles north of Globe city and adjoining the Rosalia group, belongs to Mr. M. Innis. Several men are now employed on the Bonita taking out ore and shipping the same to the United Globe smelters. All ores shipped so far have averaged about 20 per cent in copper. The mine is worked by open cuts and has been paying from the grassroots. The outlook is promising.

### Jerome Mines.

Work still progresses on claims located a short time ago near Summit station, on the Jerome railroad.

Judge DeKuhn is taking ore from his mines on Cherry creek and will work them at the Wood-Morton mill on Cherry creek.

Work is being pushed on the St. Peter-Martin properties. As progress is made in the tunnel a larger ledge and richer ore is being exposed.

Word comes from Cherry creek that the owners of the B. B. mine will commence work on that property. This mine has produced thousands of dollars' worth of gold.

Dr. Wood and Bert Morton of Jerome have purchased the Watson mill on the Verde river and will do custom work. Mr. Morton, who is an old mill man, will manage the business. Billy Pemberton has started four men at work developing the Cliff mine. This mine is in the neighborhood of the now famous Equator claim. Two of the best mining experts in this country have given it as their opinion that the Cliff claim has indications of containing a large body of ore. The force of men will be increased in a few days.

From good authority we have it that some California people have taken a lease and bond on the properties belonging to Messrs. Crandall, Hill and Britton, and that work will soon be commenced on others. These claims are situated near the Copper Matts group, about three miles below Jerome in the Black Hills. The development of these claims means more wealth for Jerome.—*Arizona Mining News.*



## Arizona Sampling Works.

The following ore lots were received at the above works the week commencing September 13 as reported by the *Mohave County Miner*.

Lefever and Flanigan, four lots of ore from the Prince Albert and Norma mines, White Hills.

Ross Blakely, concentrates from Cedar valley.

T. L. Ayres, one carload of gold ore from the Eureka mine, Cerbat.

Samoan mine, one carload.

A. N. Eaton, two lots from White Hills.

C. Galardo, two lots from Prince Albert.

Hawley & Bean, one lot from Lorena mine.

D. W. Earle & Co., carload from Ivanpah.

J. W. Garritt, two lots from Diamond Joe.

Prescott Development Company, one carload from the Elkhart.

Mr. Chas. Thompson, of the Columbia Mining company, is in Phoenix. He reports the work of development on the Columbia claims as going on rapidly. A portion of the new Allen stamp mill has been leased to work the ore and as the work of development progresses more men will be added to the force now employed.

There are eighteen men at work on the Elkhart mine at Chloride near Kingman for the Improvement Company. In the level from the 140 foot station a big body of rich lead has been encountered.

Reports from the Providence Gold Mining company's mine are very encouraging. Three shifts of men are sinking the main shaft, now down 140 feet, and showing very fine ore. Drifts are being run by two shifts of men. The company has built a saw mill at the head of the Big Bug creek which started up last month. All machinery for the new mill is on the ground except frue vanners which arrived in Prescott the fore part of last week. The working force of this company comprises fifty men, the monthly pay roll being \$1,800.

St. Peter and Martin are exhibiting some rich looking rock from a new strike in their properties, near Jerome. Development work is being pushed.

The rich strike reported in the Metallic Accident near Kingman last week is improving daily. The find is in the old workings near where the rich body was taken out twenty years ago by the late Thomas J. Christie.

W. A. Smith reports the Clark Mining district to be quiet. G. A. Kirtley, who has stayed by the Camp for years is now running an arastra and is doing fairly well.

Jas. P. Lindsey recently made an important discovery on one of his claims uncovering a four foot vein rich in gold and silver. Mr. Lindsey is now taking out ore which will pay to ship.

The Bull Dog mine at Goldfields Pinal Co., is running steadily, as is also the Mammoth, making the camp quite lively at present.

The Crowned King mill has closed down temporarily, on account of an accident to some machinery. Work was commenced Sept. 15, sinking the shaft 100 feet deeper, and during

the time this work is in progress, the mill will remain closed, as the cage for hoisting the ore has been removed and replaced with a bucket. It will take from a month to six weeks to sink the shaft this depth and establish a level at 400 feet.

D. M. Riordan on the 2d of last month bonded the mine on Cherry Creek, Yavapai county, known as the Jessie R mine, belonging to F. A. Biffer and operated by Butler & Murphy, consideration not known, but is understood to be very large.

The Old Dominion Copper Mining and Smelting Company at Globe received one of their 100-ton furnaces the middle of last month and the other has been forwarded from Geronimo. It will require but a short time to install them, as the Company has a force of good mechanics, and the work will be expedited in every way possible. The entire feed floor of the smelter has been raised fourteen inches, and this was accomplished in three days, which illustrates the rapidity with which alterations can be effected. There will be no interruption of smelting while the work of remodeling the plant is in progress. The furnace now in use will be kept in blast until one of the new ones is ready to blow in. Work in all other departments is progressing and the Company will soon have its splendid property in first-class shape for a largely increased production of copper.—*Silver Bell*.

Capt. W. H. Hardy and Dr. L. W. Childs, of Phoenix, arrived in Kingman, Arizona, Sept. 18th. They have been making a tour of northern Arizona mining camps. They have visited Jerome, Prescott, Congress and other camps in Yavapai county and are now on their way to the Chemehuevis gold diggings. Capt. Hardy is just recovering from a long and severe illness.

W. W. Clack returned Sept. 18th. from the gold diggings of the Chemehuevis mountains. He reports that the ground is yet too wet to work with a dry washer but that many of the miners there are making good wages surfacing. Fred Leonard, Maynard Hart and John Eshom are operating a machine and are doing well. The Printer's gulch is exceptionally rich and the typos are liable to make a fortune.

## CALIFORNIA.

## INYO COUNTY.

The Inyo Gold Mining Co. made a clean-up Sunday, Sept. 13th and obtained very satisfactory results. The ledge in the bottom of the shaft is reported to be looking better than ever.

## KERN COUNTY.

T. A. McLaughlin returned to Arroya Grande the first part of last week from the desert mines near Mojave, and brought some fine specimens of gold ore, showing the yellow metal sticking out all over the rock like pin heads, also gray carbonate and peacock carbonate from six ounces of which was smelted out three ounces of gold, silver and lead combined. He represents the mines as wonderfully rich, and expects to see 15,000 people in there this winter. Mr. McLaughlin has spent nearly four months at the mines and has made many valuable locations and has returned to have assays made and arrange for the working of some of his mines.

## LOS ANGELES COUNTY.

The largest chunk of gold ever taken out of Acton, was gotten out by the Red Rover Company last week; to our best estimate, it weighs about 30 pounds, 16 ounces to the pound, and is worth about \$8,000 to \$9,000. If you meet Hon. Henry T. Gage in Los Angeles, ask him if he ever seen a larger piece of pure gold; this is Acton gold, taken from the batteries of a small ten-stamp mill, and twenty-day run. Who says this can be beaten in Southern California? The thousand mark in the value of the Red Rover mine has passed, and it takes a million or more to talk in buying the Red Rover.—*Acton Rooster*.

Messrs. C. H. Broderson and Paul Marth, who own some very promising gold mines in the Tejunga, up near Acton have gone to Hamburg and Berlin in Germany, and expect to be back in about six months with sufficient capital to open up these mines. Success to them and a happy journey home.

The old Union mine near Acton is being re-opened by the Webber Oro Vista Mining Company, and the old shaft has been cleaned out to a depth of 85 feet. Some very rich ore has been taken out of this mine, and there is no doubt but what it will prove a regular bonanza to its present owners, if they just go down a few hundred feet. Besides the ore, of which there is abundance, there is lots of water in this mine, that can be pumped into a reservoir and used to a good advantage in milling.

C. A. Richey was in Acton from Lancaster week before last looking after his mining interests there.

## RIVERSIDE COUNTY.

During the inactivity of the gypsum mill at Corona (formerly South Riverside,) thieves entered the building and purloined every portable article, including the patent lubricator belonging to the engine which is alone worth \$30. The large belts have been cut and carried off piecemeal, every available tool has disappeared, and the machinery has been tampered with. The financial loss sustained will amount to more than \$100.

The people of Perris are glad to note that notwithstanding the pervading business depression the neighboring mining property is looming up in a surprising manner.

The Santa Rosa, the present leader of the mines, is sinking in both shafts. In the old shaft they are below the 500-foot level. The mill is running to its full water capacity with, according to the last three "clean ups," a net profit of over \$600 a day. The mill has added to its equipment an electrical apparatus which it is claimed will save all but a small percentage of the gold.

The prospect of Rawson and Bethmem, the Jumbo, a sister to the Santa Rosa, recently had a "clean up" of over \$1000. The ore is very rich, and promises to out rival the Santa Rosa.

There is a well-founded rumor that the Golden Chariot and the Santa Fe mines will shortly resume operations.

At present all hands are busily engaged in sinking for more water. Water can be had in any place at a very small depth.

The Santa Rosa magnates have bought up several adjoining prospects and will work them in conjunction with the Santa Rosa.



Capt. Hasson has returned and devotes some time to his claim south of the Santa Rosa.

Los Angeles parties have joined hands with J. B. Dennis and will immediately open up the claims owned by Mr. Dennis.

H. B. Varcoe has returned from England, where he has been in conference with Gavilan stockholders. Mr. Varcoe promises to put all his resources towards the development of the Gavilan property.—*San Bernardino Weekly Sun*.

#### SAN BERNARDINO COUNTY.

A. B. Montijo is in San Bernardino from the Morongo district, and brought with him a ball of gold which he had taken out of 2300 pounds of ore from his claim, the Buena Vista, working it with an *arastra*. He estimates that he was unable to save more than half of the precious metal and yet from that quantity of ore he has taken about \$125 worth.

The mine is as yet but a prospect and the work is only intended as development, but it shows that it could be worked at a profit from the first. W. D. Wagner is associated with Montijo in the ownership of the claim, which is about a mile and a half from the Rose mine near Victor. It is the intention of the owners to take out several tons of ore, and ship it to a smelter and learn by a working test what it is actually worth.

A new gold strike has been made at Calico, and that right in the midst of silver mines, where old miners said no gold ever could be found. Mr. Stevens is the discoverer, and has located fifteen claims. The ore is low grade running from four to six dollars, but the ledge is over one hundred feet in width and is easy milling. The strike will certainly prove valuable.

E. Hammond of San Bernardino and B. Prosper of Los Angeles have a claim in the Rand district that promises to become a very valuable one. Returns from the last shipment made have been received recently, and from a 100-sack lot, containing three and a quarter tons, \$850 was reduced, this makes a total of almost \$2200 that has been taken from the mine during the course of development.

Three shafts have been sunk and the endeavor has been to expose the ledge as much as possible. The richest ore comes from a ledge only 16 inches in with but the average showing made has been at the rate of \$121 a ton. The mine is located exactly on the border line of San Bernardino county.

#### A Well in the Desert.

An old Riverside prospector, who has spent much time of late on the desert sections of Southern California in search of the precious metals, took occasion Sept. 17th, to make a few remarks concerning the action of the Supervisors in causing a well to be sunk between Indio and Palm Springs station. This old veteran said a more humane act they could not do, and neither could they expend the same amount of money on any other project that would return as good a profit to the county in the long run. A supply of water was greatly needed at the point named, and miners and all other travelers will hail with delight the news that a water station has been provided there.

John Hall who is interested with Messrs. A. S. White and Silas Masters in some valuable mines on the desert beyond Indio and

who was in Riverside for a few days last month returned to the mines Sept. 20th, accompanied by Geo. Master.

Mr. Hall has spent most of his time out at the mines for some months past, and he can now be considered a full fledged frontiersman and miner. He was too busy before he left to spend much time in answering questions, but he did say that the mines in which he is interested are among the most promising on the desert.

#### NEW MEXICO.

The Graphic mine and smelter at Magdalena and Kelly are working away all the time and the smelter is turning out its usual quantities of bullion.

The Wichita Mining Company, represented by Mr. Majors, located in Grouse gulch, near Elizabethtown, expect to have a mill in there soon.

Word reaches Las Vegas that a half-interest in a mine at Cow creek in the Hopewell district had been sold to Kansas City parties for \$50,000.

The Perry Brothers are still taking out some very fine ore on the Little Luella mine at Kelly.

Rothgeb & Slattery have about completed the building of their smelter at the "Golden Dawn" mine in Water Canyon, Socorro county.

Messrs. Wickham and Mann, San Marcial carpenters, went to Rosedale to work on the new mill. Between twenty and twenty-five men are employed there.

The School of Mines at Socorro, opened September 21. There was a good attendance and the school started in excellent shape for another good year's work.

#### BLAND NOTES.

Work has been resumed on the Bland tunnel near Bland, on a small scale at present, but it is hoped that before long some extensive work will be done.

Last week a piece of quartz carrying free gold was picked up on a claim in a canyon, near Bland. It is of an entirely different character than any that has been shipped from the camp and is literally alive with the yellow metal.

George Ostrander was in Bland from Perelta during the week and reports that Harry Wood returned from Albuquerque and has resumed work with Joe Either and A. Kornbluh, equal owners with Wood, on the claim in which they recently made a rich strike of high grade ore, which Mr. Ostrander says is a two foot vein of solid mineral. He also reports that Messrs. Leland and McFarland of Albuquerque have taken an interest in several of his claims on which some very extensive development work will be pushed.

The Bayard Smelting and Milling Company has filed articles of incorporation with the territorial secretary. Incorporators, George S. Cartwright, W. D. Murray, of New Mexico; Samuel L. Small, of Philadelphia. Objects, mining and reducing ores; capital stock \$600,000; life fifty years; directors, same as incorporators; principal place of business, Central City, N. M.

Sept. 18th a small rich streak was encountered in the lower tunnel of the Good Hope, near Bland. They have not reached the main lead, the strike mentioned being a spur of the main lead and very rich. There is no doubt that the Good Hope will be one of the shippers of the district when the lead which was tapped in the upper tunnel is cut in the lower.

#### MEXICO.

The Regla Electric Power Transmission Company, of Pachuca, will begin about the first of this month, to send power into that important mining city from waterfalls 27 miles distant. The company estimates that it will be able to furnish 1,200 horse-power. Several great reduction works will take this power at an annual charge of \$250 per horse-power per 24 continuous hours. Nearly all the machinery and electrical supplies for this equipment are from the United States. An improvement in mining stocks is expected in that locality.

The mines of Pachuca, State of Hidalgo, turn out annually \$7,000,000 or \$8,000,000 worth of silver.

The Valenciano mine in Guanajuato is said to have yielded, in its time, \$800,000,000 worth of silver.

#### This Year's Mines.

In the second half of the fiscal year, 1895-96, there were issued 1,044 titles to mines, covering a superficial area of 7,966 hectares, (nearly 2½ acres) says the *Financier*. The number is just equal to that of the deeds issued during the whole of the fiscal year, 1894-'95, and the area covered is greater than in that year. This is very satisfactory, as it shows that the interest in mining here is on the increase. It is also a proof of greater activity on the part of the mining bureau in the dispatch of business.

The titles issued during the whole of the fiscal year numbered 1,924, covering an area of 15,451 hectares. The following table shows the number of deeds issued and the area covered thereby in each fiscal year since the present mining law came into force: Fiscal year 1892-'93, 417 titles, covering 2,660 hectares 7,604 square meters. Fiscal year 1893-'94, 961 titles, covering 7,860 hectares 2,902 square meters. Fiscal year 1895-'96, 1,924 titles, covering 15,451 hectares 5,161 square meters. Total, 4,346 titles, covering 31,803 hectares 387 square meters.

#### The Pachuca Mines.

The management of the Maravill mines in Pachuca, state of Hidalgo, has presented to the Secretary of Fomento a plan for the drainage of the inundated mines, which it is hoped will prove effectual. In accordance with this plan, those mines that have pumping machinery of their own will be taxed 5 per cent of their output, and those without pumps 10 per cent towards defraying the expenses of the work of drainage. The San Rafael and Real del Monte companies have signified their willingness to accept this arrangement.

The installation of the pump for the Carmen mine continues, and the balance of the pump is expected to arrive very soon. The pump is of English make.

A syndicate has been organized at Tacoma, Washington, for the erection of a 200-ton smelter at Vancouver, B. C., to cost \$750,000.



## GENERAL NEWS—CONTINUED

A Scotch syndicate has paid \$1,500,000 for the Diamond Hill property at Townsend, Mont., and will put an additional 100 stamps in the mill.

Butte, Montana, is probably the liveliest mining town in America. The pay roll approximates a million dollars a month. The lowest wages are \$3 a day, miners receiving \$3.50. Butte has almost 40,000 population.

The foundry at Bakersfield, Cal., completed its first casting on Saturday night Sept. 19th, when a mortar or battery was made for the Long Tom mine up on Poso creek, north of Bakersfield in Kern Co. The mortar weighed about 2900 lbs. and the job was a perfect one. The thing will be used in the five stamp mill at the mine. The next castings will be made on Thursday, when a big lot of things will be turned out, including some shoes and dies for several mines up in the Kernville country.

We are in receipt of the handsome catalogue, No. 46, from the Jeffrey Manufacturing Company, of Columbus, Ohio. It is a treatise of Coal Washing Machinery, (the Robinson patents) and a general description of some of the Jeffrey mining machinery and chain conveyors. There are a number of elegant half-tone illustrations and line cuts, which gives one an idea of the magnitude of their productions.

The testimonials speak very highly of the Robinson patent coal washers. The advice, tables and other reading matter are worthy of consideration and may be found very useful.

The pamphlet is printed on fine glazed paper, and on the whole it is very neatly gotten up. Any one wishing information in regard to the machinery manufactured and handled by the Jeffrey Manufacturing Company are requested to send for their catalogues and other printed matter.

## Remarkable Water Force.

The effect of the hydraulic motor, which is now being used for the purpose of removing masses of earth, well nigh passes belief. A stream of water issuing from a pipe six inches in diameter, with a fall behind it of 375 feet, will carry away a solid rock weighing a ton or more to a distance of 50 or 100 feet.

The velocity of the stream is terrific and the column of water projected is so solid that if a crowbar or other heavy object be thrust against it, the impinging object will be hurled a considerable distance. By this stream of water a man would be instantly killed if he came in contact with it, even at a distance of 200 feet.

At 200 feet from the nozzle a six-inch stream with 375 feet fall, projected momentarily against the trunk of a tree, will in a second denude it of the heaviest bark as cleanly as if it had been cut with an axe.

## PERSONAL—NEWS ITEMS

Malcolm McLeish left Phoenix, Ariz., Sept. 14th, for the Vulture mine. He has a force of men at work putting up a cyanide plant.

Donald Stewart, representative of the Washburn and Moen Manufacturing Company, has returned to the City of Mexico from his trip to Guadalajara and other interior points.

J. R. Thame, of the Holcomb Valley Company, in Holcomb Valley, San Bernardino county, near Victor, made the JOURNAL a short visit, while en route to his old home in England.

J. A. Phillips left Phoenix, Ariz., Sept. 16th, for Prescott, to inspect his mining claims near that place.

Mr. W. R. Boggs, the mining expert, and Mr. E. H. Essery, the assayer, have returned to the City of Mexico from a professional trip to Pachuca, State of Hidalgo. The properties of La Luz and Progreso were visited by these well known mining men who were tendered a sumptuous banquet by their friends.

J. B. Dennis, of Perris, California, was a visitor at the JOURNAL office from Perris, the 28th ult.

W. P. Hall was in Prescott, Ariz., Sept. 17th, from the McCabe mine near that place.

Hon. J. Ives Limantour, Secretary of the Treasury of Mexico, has decided to resume his official duties on Monday, September 21st.

Joseph Geroux, the well known and popular superintendent of the United Verde copper mines, at Jerome, Ariz., was in Phoenix for a couple of days' stay the middle of last month.

T. J. Cantrell, vice-president of the Ybarra Gold Mining Company, and Mr. Twigg, one of the directors, arrived in Ensenada, Lower California, from San Francisco, the 14th of September, going from San Diego on the schooner Anita, and have gone down to the mines at Calmali.

E. M. Foltz, of the Gladiator mine, near Prescott, Arizona, was in Prescott, September 18th.

P. L. Griffin returned to Ensenada, Lower California, September 16th, from Los Angeles, California, and went out to Alamo the next day. Mr. Griffin, with W. E. Hayward, are re-opening the Moctezuma mine at that place.

Geo. R. Sutherland, a mining man of Pine Mountain, Michigan, was in Prescott, Arizona, the middle of last month.

Frank Baxter, of Walters Station, Riverside Co., California, was a caller at the JOURNAL office the fore part of September. Mr. Baxter has been prospecting in the vicinity of the Eagle Mountains.

S. B. Brillhart, of Las Cruces, was in White Oaks, N. M., the middle of last month, in the interest of his mining property in the Jacarillas.

Hon Nick Gales and E. V. B. Hoes left Prescott, Ariz., Sept. 15th, for the Santa Maria country, about 80 or 90 miles west of Prescott.

W. H. Stevens, of Parsons, Kansas, was in White Oaks, N. M., the fore part of last week, looking for gold mines in that section.

Mr. Penrose, one of the owners of the Pearce mine, was in Pearce, Cochise County, Arizona, a few days the middle part of last month.

E. Ross Brown, of San Miguel, N. M., is in White Oaks, N. M., inspecting some gold mines for eastern capitalists.

Jack Nelson, of the Crowned King mine, near Prescott, Arizona, was in Prescott, Sept. 15th.

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W. A. Smith, of the Clark mining district, was a visitor at Solomonville, Arizona, Sept. 15th.

Matt Doyle, an old-time miner of Silver City, was at that place, Saturday, Sept. 12th, from Pyramid, N. M.

Hon. Jos. B. Scott, of Tucson, the well known miner and ex-sheriff, returned to Phoenix, Arizona, from the Williams convention.

D. V. Coleman, the mill and mine operator, returned to Silver City, from Arizona, Sept. 12th.

Two sons of J. B. Davis, recent arrivals in Kingman, Arizona, from Kansas, are assisting the old man in his dry diggings in the Chemehuevis mountains. They are taking out about four dollars per day each.

Col. Hugh McDonald, a prominent mining man of California, was in Las Cruces, Sept. 16th, as a guest of Major W. H. H. Llewellyn.

Any one wishing a first class foreman, in a copper or lead smelting works, one who understands blast furnaces, ore sampling, handling men, etc., one who can speak Spanish very fluently, and has the very best of references, will read the Plomo ad. near the center of page 18.

Mr. Heiser, a miner out in the Hell Canyon district, New Mexico, who was sojourning at Jemez Hot Springs the past few weeks, returned to Albuquerque.

Mr. Goodfellow, a well known prospector and expert miner, who is engaged in prospecting for paying quartz out in the desert, was in Riverside, Cal., Sept. 19th.

Mr. A. Sweeney, of Raton, New Mexico, has gone to Hopewell, N. M., to finish assessment work on his mining prospects.

H. N. Stockton started out from Bakersfield, Cal., Sept. 16th, for the desert mines to try and get rich.

W. C. Rust, of Raton, returned to Hopewell, New Mexico, the first of the week, to continue development work on his own and the Yellow Dog properties.

G. F. Weeks left Bakersfield, Sept. 16th, for the desert mines in search of a fortune. We hope he succeeds.

F. Frank, who has been at Peralta canyon, near Bland, New Mexico, for the past ten days, looking after his mining interests, returned to Albuquerque, N. M., September 16th.

J. D. Browne left for the desert mines the middle of September, with the intention of getting rich.

Arthur Nichol was in Lordsburg, N. M., the first of last week, returning from Silver City, N. M., to Arizona. Mr. Nichol and J. D. Smith are mining at Apache Pass, where they are opening up a fine gold proposition.

Mr. Briggs, of Perris, Cal., who lives at present at the Leon mine, near Winchester, Cal., is expected to die at any time. Most all of his children have been summoned to his bedside. He has been a consumptive for some years.

James Mieggs returned to Lincoln, N. M., from the Organ mountains, the 15th of September, where he has been developing some mines which he is interested in.

Henry T. Gage, of Los Angeles, Cal., was in Acton, Cal., last month, looking after his interest at the Red Rover, and reports the mine is looking better every day.

W. W. Thomas was in Escondido, from Los Angeles, again last week, looking after the development of the old Escondido gold mines.

Chas Court, who has lived at Alvord, Inyo county, for the last three years, has left that section for Midas, (formerly Ione) Nye county, Nevada, where he will engage in mining.

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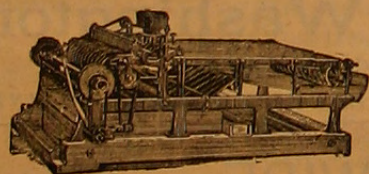
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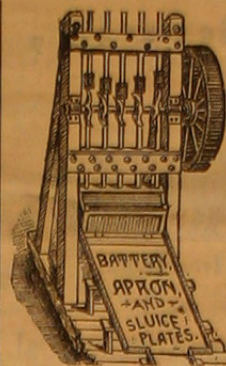
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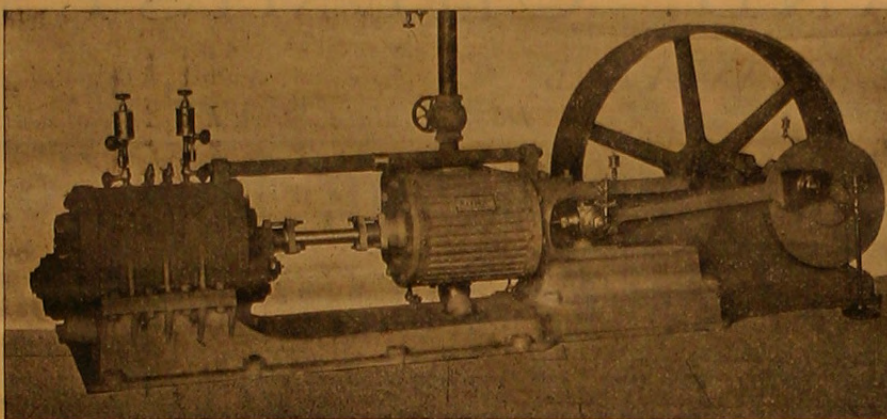
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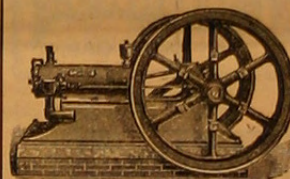
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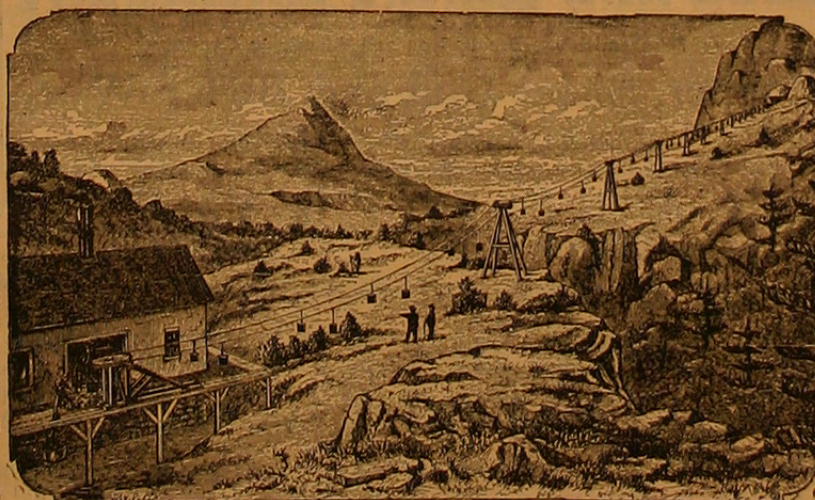
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New York Quotations:

	SILVER.	COPPER.	LEAD
Sept. 16	66	11 00	2 70
" 17	65 1/2	10 90	2 60
" 18	65 1/2	10 90	2 60
" 19	65 1/2	10 85	2 60
" 21	65 1/2	10 85	2 65
" 22	65 1/2	10 80	2 70
" 23	65 1/2	10 80	2 75
" 24	65 1/2	10 75	2 80
" 25	65 1/2	10 75	2 80
" 26	65 1/2	10 75	2 80
" 28	65 1/2	10 75	2 80
" 29	65 1/2	10 75	2 80
" 30	65 1/2	10 75	2 80

### MINING STOCK QUOTATIONS.

#### BOSTON

Allouez	50	Franklin	10 00
Atlantic	16 00	Kearsarge	10 00
Boston & Mont'a	75 00	Osceola	23 00
Butte & Boston	1 50	Quincy	108 00
Cal. & Helca	300 00	Tamarack	75 00
Centennial	2 00	Wolverine	8 50

#### COLORADO SPRINGS STOCKS

Anaconda	58	Mellie Gibson	55
Blue Bell	05	Matoa	11
Colfax	05 1/2	Mount Rosa	12
Columbine	03 1/2	Ophir	07
Fanny Rawlins	05	Orphan Bell	13
Gold King	53	Pharmacist	10
Gold and Globe	22	Portland	1 45
Isabella	54	Work	9
Jack Pot	04	World	02 1/2
Jefferson	18	Del Monte	03 1/2
Monarch	08		

#### DENVER STOCK REPORT.

Alamo	03	Anaconda	58
Bangkok	05	Aola	03
Bankers	10	Big Six	10
Croesus	05	Boston & Id	17
C. C. Con	13	Colfax	06
Chimbarazo	03	Gold & Globe	17
C. & C.	04	Mellie Gibson	50
Golden Fleece	85	Mt. Rosa	12
Gold Standard	04	Pharmacist	10
Isabella	54	Union Gold	30

#### HELENA, MONTANA

Alice	25	Granite Mount	1 85
Bald Butte	2 55	Hope	1 50
Benton Group	10	Iron Mountain	42
Bi-Metallic	3 00	Ontario	1 00
Elizabeth	10	Poorman	40

#### NEW YORK.

Crown Point	45	Sierra Nevada	65
Con. Cal. & Va.	1 80	Standard	2 75
Gould & Curry	80	Union Con	53
Hale & Norcross	1 25	Iron Silver	10
Homestake	80	Quicksilver	3 00
Mexican	50	Quicksilver pfd	17 02
Ontario	14 50	Bulwer	25
Ophir	1 30	Yellow Jacket	35
Plymouth	20	Deadwood	45

#### SAN FRANCISCO.

Alta	10	Mono	15
Belcher	37	Nevada Queen	05
Best & Belcher	95	Ophir	95
Bodie Con	55	Potosi	95
Chollar	2 25	Savage	75
Con. Cal. & Va.	1 80	Sierra Nevada	53
Crown Point	45	Union Con	45
Hale & Norcross	1 25	Utah	11
Mexican	55	Yellow Jacket	45
Gould & Curry	85	Bulwer	25

#### ST. LOUIS.

American Nettle	25	Elizabeth	20
Granite Mt.	1 50	Leo	3
Adams	80	Hope	1 40
Bi-metallic	3 30	Small Hopes	90

#### SALT LAKE CITY

Ajax	85	Eureka Hill	120 00
Alliance	30	Horn Silver	2 05
Am. Nat. G's	03	Little Pittsburg	03
Anchor	1 25	Lucky Hill	25
Appex	07	Mammoth	3 05
Bogan	20	Meers	50
Bull, Beck	8 70	Mercur	7 10
Cane Springs	80	New Tintic	2 80
Cent. Eureka	75 00	Niagara	2 25
Cleve. Con	45	No. Eureka	05
Comstock	15	North Spy	2 40
Crecent	04	Ontario	12 00
Dalton	04	Silver King	17 25
Daly	7 50	Silver Spar	1 00
Daly West	8 70	Tetro	02
Elko	20	Utah	1 85

#### MEXICO

Name of Company	State	Price
Angustias	Guanajuato	\$ 400
Asturiana y Anexas	Zacatecas	440
Cerro Colorado	Chihuahua	10
Concepcion y Anexas	S. Luis Potosi	180
El Oro	Guanajuato	80
do. pre.	"	00
Luz de Borda	Michoacan	30
do. Free stock	"	30
Luz de Maravillas	Hidalgo	110
Real del Monte	"	850
Rosario y Anexas	Durango	70
do. pre.	"	50
San Rafael del Oro	Guanajuato	80
Sta. Gertr. y Anexas	Hidalgo	187
do. Free Stock	"	301
Sto. Maria de la Paz	S. Luis Potosi	500
Tlaulizingo	Puebla	000
Zomelahuacan (gold)	Vera Cruz	91
Zona Min de Pozos	Guanajuato	5

NOTE—The above Mexican stocks are figured on the basis of Mexican silver



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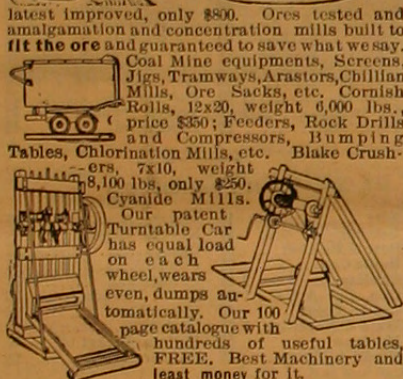
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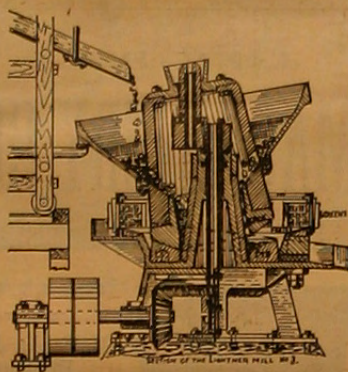
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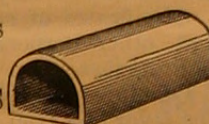
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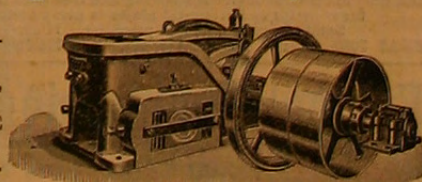
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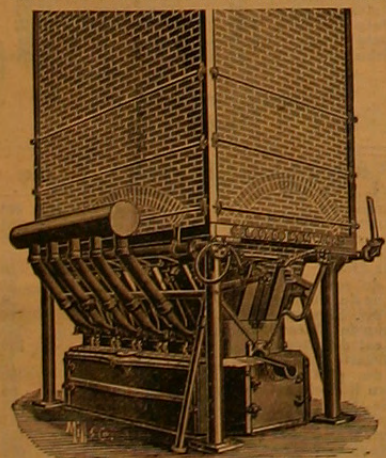
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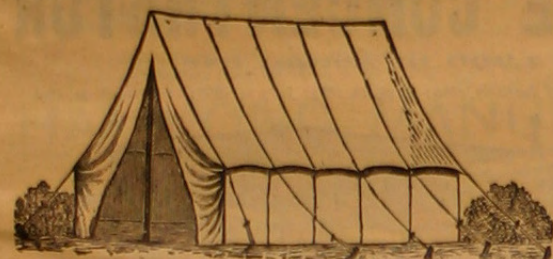
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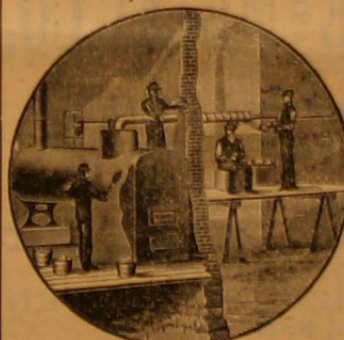
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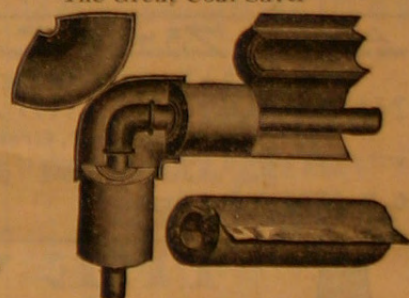
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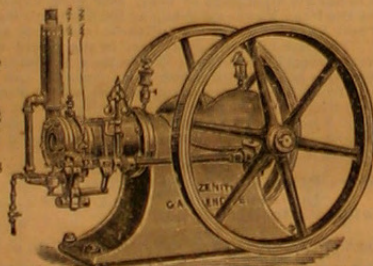


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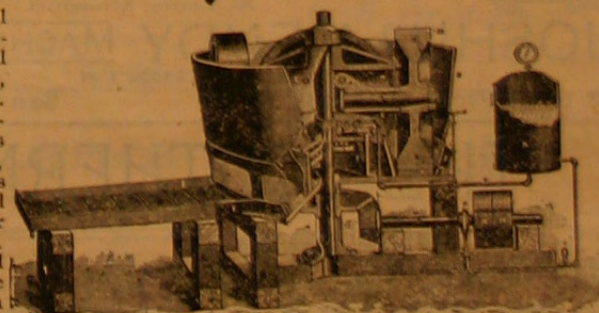
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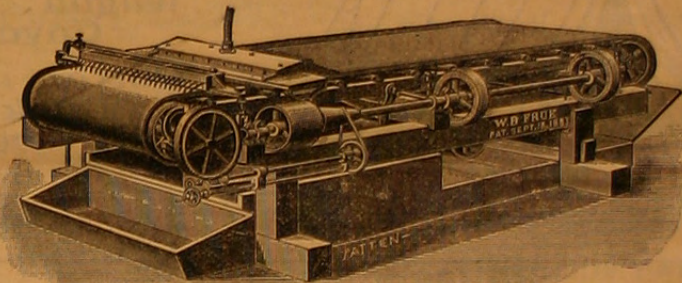
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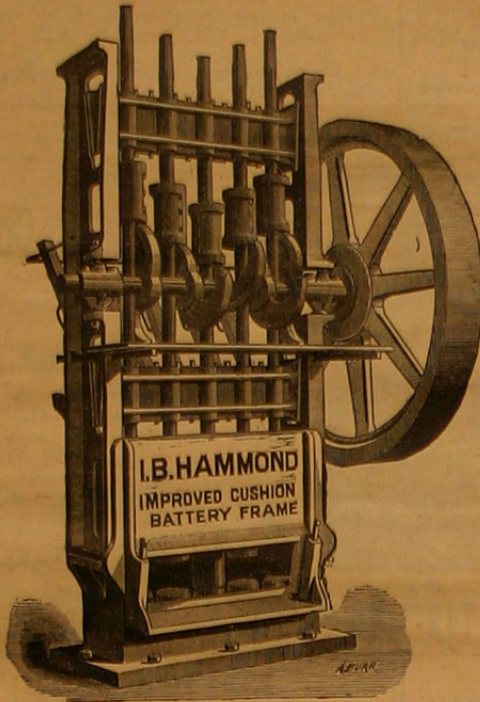
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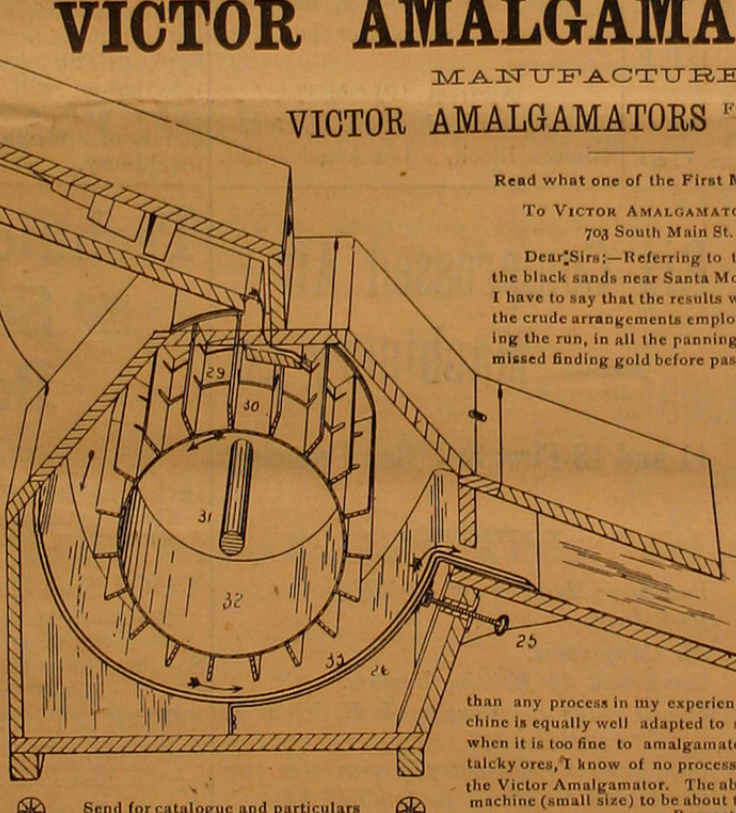
Read what one of the First Mill Men in the County Says of it

To VICTOR AMALGAMATOR CO  
703 South Main St. Los Angeles, Cal., May 20, 1896

Dear Sirs:—Referring to the run made by me of fifty tons of the black sands near Santa Monica with the Victor Amalgamator I have to say that the results were quite satisfactory, considering the crude arrangements employed in feeding the machine. During the run, in all the panning (of over one hundred) I never missed finding gold before passing through the machine, and after passing the machine, I found only two colors in panning after going through; In other words, only two colors were found in the tailings after panning over 120 pans. Of the many methods that have been tried for saving the gold from the sea-sands on this coast for the last twenty-five years, none have given as satisfactory results as the Victor. I have no hesitation in saying that the machine properly handled, will save a larger per centage of gold contained in sea-sands

than any process in my experience of over thirty years. The machine is equally well adapted to saving the gold from mill tailings when it is too fine to amalgamate on ordinary plates. In milling talcky ores, I know of no process so well adapted to saving gold as the Victor Amalgamator. The above run showed the capacity of the machine (small size) to be about twenty-five tons per day.

Respectfully, GEO. O. KILBOURNE.



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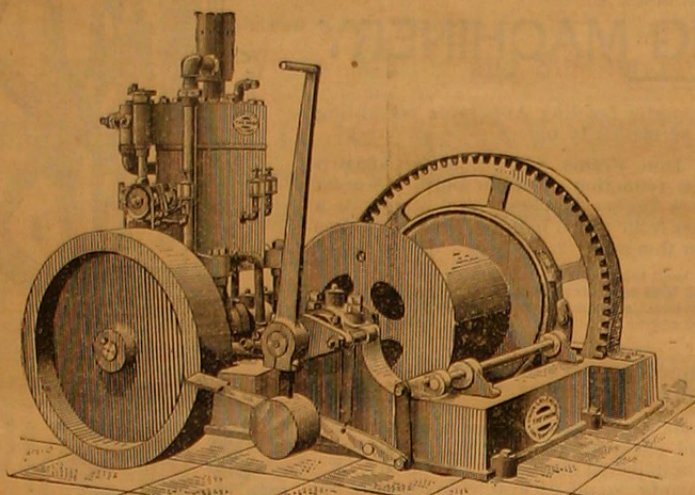
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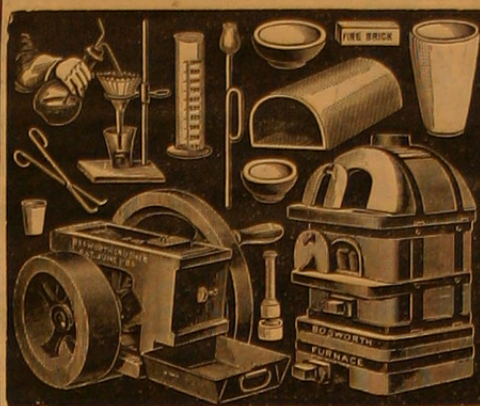
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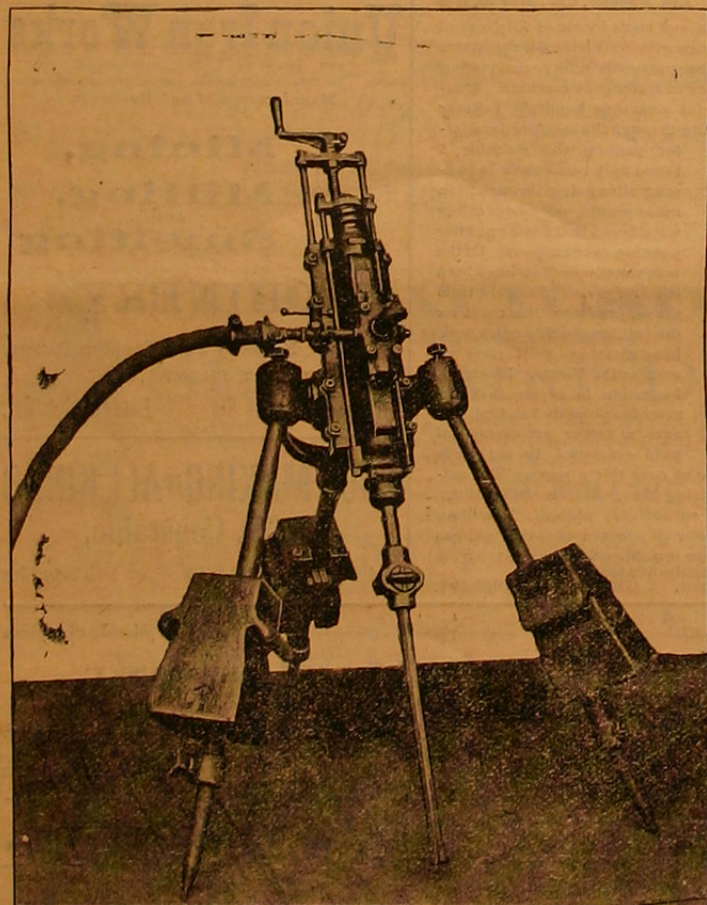
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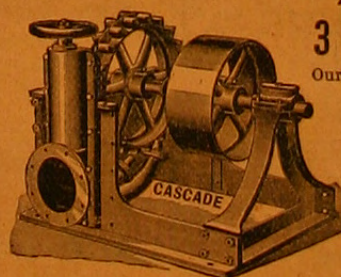
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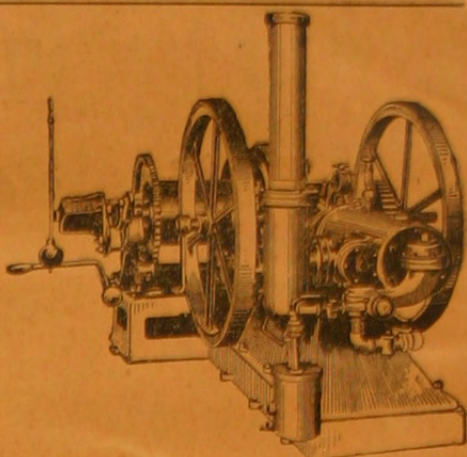
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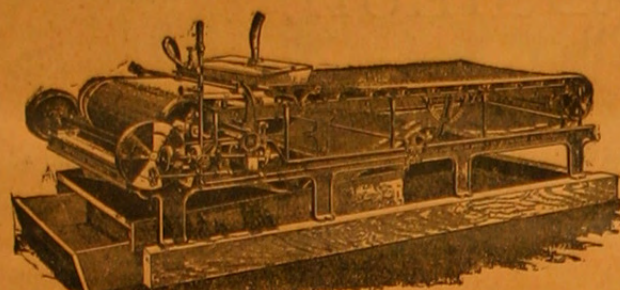
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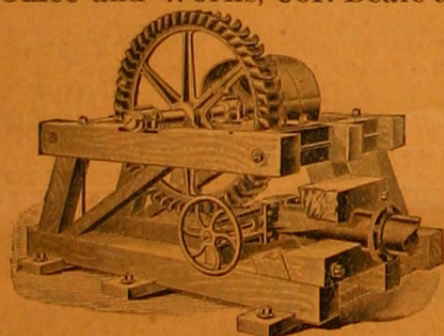
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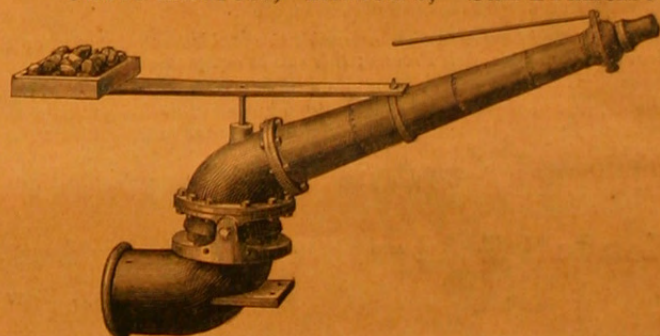
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